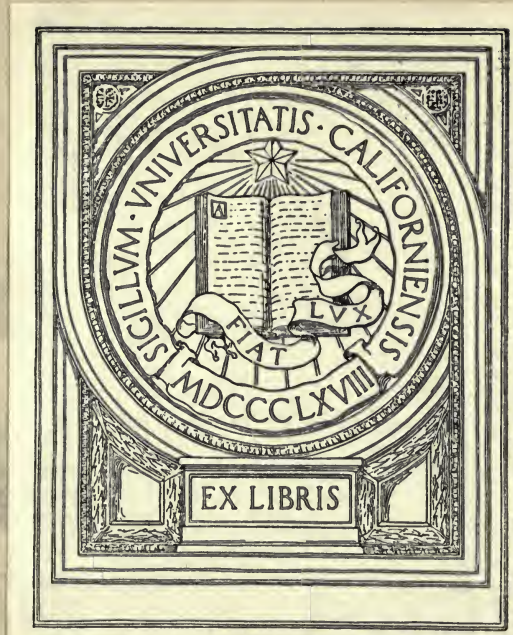
THE TOP OF THE CONTINENT

ROBERT STERLING YARD



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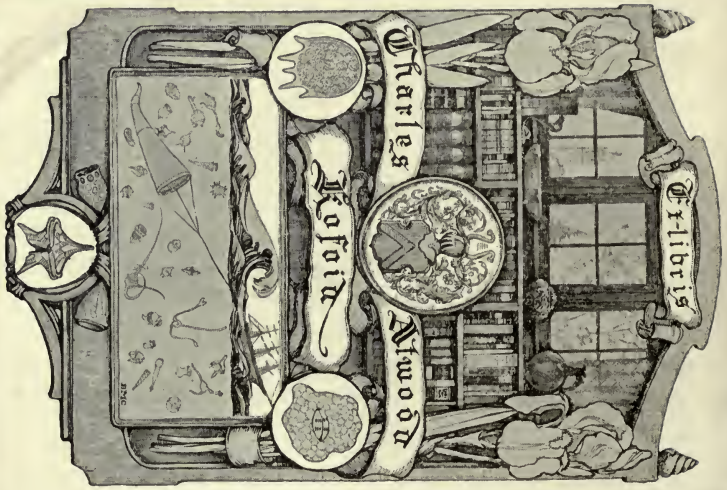

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THE TOP OF THE CONTINENT

From an autochrome photograph by Charles J. Belden

Yellowstone Falls

THE TOP OF THE CONTINENT

THE STORY OF A CHEERFUL JOURNEY
THROUGH OUR NATIONAL PARKS

BY

ROBERT STERLING YARD, 1861-
NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR

CHARLES SCRIBNER'S SONS
NEW YORK CHICAGO BOSTON

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TO
MARGARET

FOREWORD

Our national parks are really one part of our national system of education—supreme examples of the workings of nature. They tell the history of the making of the continent, where the primal forces may yet be seen in action. They give a liberal education in beauty and in nobility. Men cannot think meanly in the presence of the canyons and cliffs, the mountains and the cataracts, of our parks. Men must think in large terms when standing face to face with nature in her noblest moods.

Mr. Yard loves these playgrounds, natural museums and living laboratories of a fortunate people, and I join in the hope that they may become more really known as great schools.

Franklin K. Lane.

PREFACE

THE purpose of this book is to inspire an interest in the drama of world-making and an appreciation of the meaning of natural scenery. It is intended for children of all ages—young, old, and in between.

It is not a scientific book, not a manual of study, in any sense; it is only a story. It will have served its purpose if those who read it find pleasure in the reading, learn of many things which they knew not of and little appreciated, and thereafter look with kindling eye upon the mountains, the rivers, and the valleys of their great land.

This land is richer in scenery of sublimity than any other. Geology is the anatomy of scenery. To train the emotions to conscious and appreciative expression is to increase measurably the sum of happiness.

The fictional medium is my excuse for one conscious departure from fact. The leisurely excursion here described could not be compassed within a single vacation season.

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THE TOP OF THE CONTINENT

Photograph by J. T. Boyeson

The greatest rock in America—El Capitan—rising 3,600 feet above the Yosemite Valley floor

Photograph by Enos Mills

THE TOP OF THE CONTINENT

I

HOW IT HAPPENED

IT NEVER WOULD HAVE HAPPENED IF MARGARET HAD NOT PERSEVERED

"MOTHER, where is the top of the continent?" asked Margaret.

The family was gathered around the library fire after dinner. There was still a half hour left before bedtime. The wind was howling through the bare trees on the lawn, and the snow was beating a tattoo upon the window-pane. But the Jefferson library

seemed all the warmer because of the cold storm without. Uncle Tom had put a fresh chestnut log on the andirons, and it crackled merrily as the sparks flew in all directions.

"Look out," said Aunt Jane, "those sparks may scorch the rug. Jack, you'd better set up the screen."

"Mother, where is the top of the continent?" asked Margaret.

"Not that way, you bad boy!" cried Aunt Jane. "You've set it upside down."

"What difference does it make?" asked careless Jack, thrusting his hands in his pockets. "It'll stop the sparks upside down, won't it?"

Aunt Jane readjusted the screen and retreated, rubbing her pretty cheeks now glowing with heat. Even Jack admitted that Aunt Jane was pretty.

"Mother, where is the top of the continent?" asked Margaret.

"B-r-r-r!" grumbled Uncle Tom. "Do you hear that icy blast? I tell you it's unchristian to send a fellow home such a night as this. Let me sleep on the lounge."

"Why, of course you may," said Mother, looking indulgently at her handsome young brother-in-law. "We'll make you up some kind of a bed."

"He may sleep with me," said Jack condescendingly. "Only he's got to stay on his own side of the bed. If he doesn't, I'll kick."

"Mother, where is the top of the continent?" asked Margaret

"You'll kick anyway, you young mule," said Uncle Tom, "but I'd rather be kicked than walk a mile home against that storm."

"Mother, where is the top of the continent?" asked Margaret.

"Dear me, child," said Mrs. Jefferson, "if you did not get an answer you would go on asking that question

in your sleep and put it to me again before breakfast. I'm sure I don't know where the top of the continent is, or what it is either. Who did you hear speak of it?"

"Oh, Uncle Billy told Daddy at dinner that it was where he photographed that bear," said Margaret. "He said the top of the continent was the most wonderful place in the world; I think it must be most as 'stonishing a place as Fairyland. He said he saw a waterfall most a hundred miles high, and that there were things he called glaciers that dug ditches in the rocks more than a mile deep. He said there were lots of bears and deer there, and I think he said lions. Oh, yes, and there was a lake that had icebergs in it in summer, and you slept out under the trees, and there were millions and millions of mountains that had snow on them in August. He said you could run out for a few minutes in the morning and catch all the trout you could eat for breakfast, and that you rode on mules, and that there were trees a whole block thick and ever and ever so high, and that there were 'normous big white goats with whiskers that climbed up rocks just like flies climb the wall, and there were boats on the lakes and——"

"Not so fast, child!" interrupted Mother, but Margaret was running too rapidly to stop all at once.

"It was all just too lovely except the bears. I wouldn't want to sleep under the trees with bears around. I'd want to——"

"I would," cried Jack. "I'd shoot the bears. I'd just like to see a bear come for me when I was asleep under a tree. I'd jump up quick and send a bullet crashing right through his head. I would——"

"Like fun, you would!" put in Uncle Tom unfeelingly. "You'd run."

"And how would you know he was coming if you were asleep?" asked literal Margaret.

"Oh, I would know, all right," said Jack. "The Indians always do. I'd have a——"

"One at a time, children," commanded Mother. "Now be still for a few moments and let me talk. I know now what Uncle Billy meant by the top of the continent, but I think, dearie, that you have exaggerated what he told Daddy. He was speaking of the week he spent last summer in the Glacier National Park. By the top of the continent he must have meant the very high mountains in the West. Uncle Billy came home so pleased with his week on the mountain-tops that he wants to go again next summer. He wants to spend three or four months in the West and see all the national parks."

"Will he take me?" screamed Margaret, scrambling to her feet and rushing to her Mother. "Oh, will he, will he take me?"

"Will he take me?" cried Jack, jumping up. "Oh, goody! Oh, great! Are there Indians there?"

"Hush! Hush!" cried Mother, retreating before the assault. "No, of course he won't take you. Children cannot go to such rough places. I wouldn't let him take you."

"Besides, he's going to take me," said Uncle Tom. "We're going to start the last week in May and go straight to the Yosemite so as to see the falls at their best."

"Oh, take me, too, Uncle Tom, dear Uncle Tom!" cried both the children at once. It was Uncle Tom's turn to retreat, for their charge was vigorous.

"Sorry, but I can't do it," said Uncle Tom emphatically. "We're going to places where children cannot go."

"But children do go to national parks," wailed Margaret. "Dorothy went with her mother to Messy Fur last summer, and she isn't as old as I am."

"To—where?" demanded Aunt Jane. "Is that extraordinary messy place a national park?"

"Of course Messy Fur is a national park," Margaret stated with dignity, "for Dorothy told me so. It's awfully nice and spooky. You climb down under 'normous cliffs, and there's houses, old, old houses that people haven't lived in for millions of years. But the Indians say that ghosts live in them, and they will not go near them, and——"

"Oh, I know now," Mother interrupted. "It isn't anything messy at all, Margaret. Mrs. Jones went to the Mesa Verde National Park in Colorado where those wonderful prehistoric cities were found."

"But, Mother, how can it be a park if it is like what Margaret says?" protested Jack. "A park has benches and swans and things and you get ice-cream at the Casino. But Margaret says there are Indians out there. That can't be a park."

"A national park, children," explained Uncle Tom, "is not like any city park. It is thousands of times bigger. There are a few hundred acres in our Fairmount Park, for instance, but more than a thousand square miles in Glacier National Park."

"Gee!" exclaimed Jack. "It must be a whopper then, for every square mile has six hundred and forty acres in it."

"Oh!" said Margaret, appalled. They stopped a

minute to multiply a thousand square miles by six hundred and forty.

"Then," continued Uncle Tom, "there are other differences. A national park is left just exactly as nature made it. They don't cut trees or make lawns or put swans on the lakes. It is an enormous wild place that the Government leaves just as God designed it, because God made it so magnificent that it would be quite spoiled if men tried to improve it."

"Oh, take us, take us to the top of the continent, dear Uncle Billy!"

"All wild and mountainy and jungly and full of animals?" asked Jack excitedly.

"Just like that," said Uncle Tom.

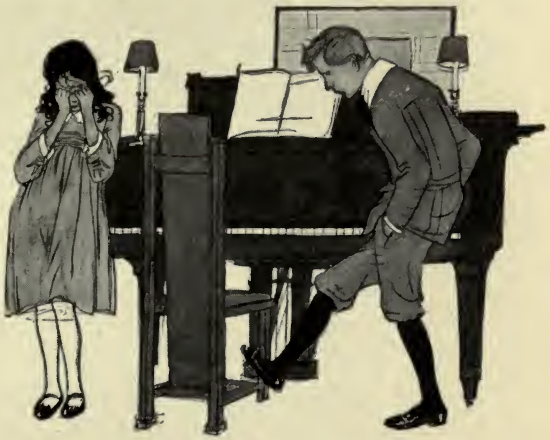
"Oh, I must go!" Jack exclaimed fervently.

"Well, here comes Uncle Billy with Dad," said Mother. "Ask him to tell you more about the top of the continent."

The children rushed for Uncle Billy with arms out-

stretched, crying: "Oh, take us, take us to the top of the continent, dear Uncle Billy!"

Uncle Billy and Uncle Tom were twin brothers, but they did not resemble each other in any respect. Uncle Billy was fair-haired and smooth-shaven, round-faced and jolly. Uncle Tom was slender and dark-haired, and wore a tiny young mustache, of which his older brother, Mr. Jefferson, made endless sport. He was quiet and studious. When the children wanted a romp they sought Uncle Billy. When they wanted information they asked Uncle Tom. Aunt Jane, by the way, was Mrs. Jefferson's younger sister, who was home for the holidays from her sophomore year at Vassar.



Margaret began to weep silently, while Jack kicked the piano-chair

"What mischief have you been doing here, Tom?" asked Uncle Billy when at length he had untangled

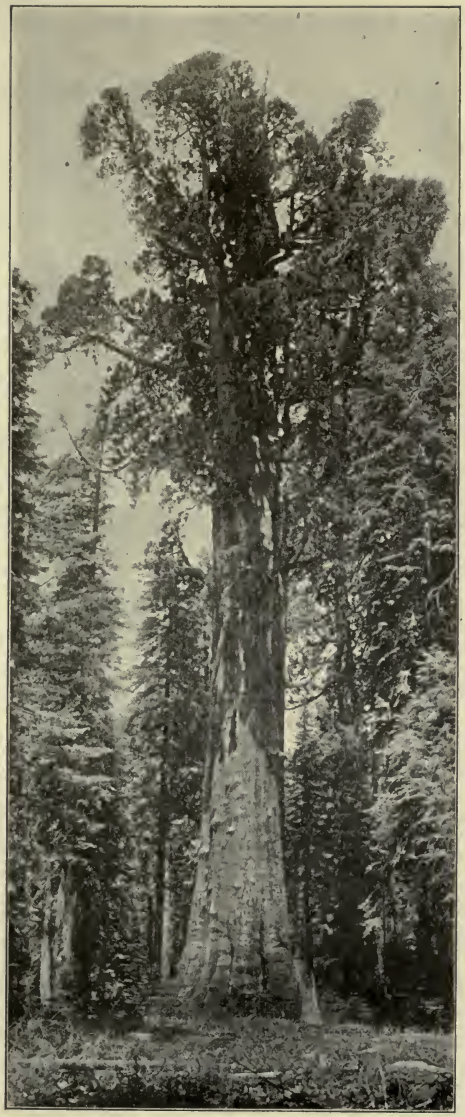
himself and the situation. "You ought not to have filled these children's heads with this notion of going with us on our trip next summer."

"I didn't," said Uncle Tom; "on the contrary, I told them emphatically that they could not go."

Margaret began to weep silently, while Jack kicked the piano-chair as if he wanted to hurt it.

"It's no trip for children," Mother declared. "Climbing mountains and riding mules close to precipices and sleeping out in forests—I cannot see how the subject ever even came up. The national parks may be very well for hardy young men in their senior vacations, but they are no places for children—or for women, either."

"Oh, aren't they though?" cried Uncle Billy. "That's just where you are good and mistaken, Sister mine. They are exactly the places for women and children—and old folks and everybody else. There are good hotels and good comfortable camps, good automobile roads and splendid safe trails. Thousands of people visit them every summer—more women and children than men by a good many. There are usually good doctors to be found, but people are so well in the mountains that they seldom need doctors. It is healthier even than home. No, as a matter of fact,



The General Sherman Tree, Sequoia National Park. The biggest and the oldest living thing

the national parks are the finest places in the world to take children."

"But I wouldn't trust the children to you harum-scarum young men," said Mother decidedly, "so let there be an end to this talk. Besides, I couldn't live a summer without them."

"And I wouldn't go without Mother," said Margaret plaintively, snuggling close to her Mother's side.

"Not even with me?" asked Uncle Billy teasingly.

Margaret slowly but decidedly shook her head. Then her face brightened and she began to jump up and down excitedly.

"But Mother shall go with us if it's so nice and comfy up there!" she cried. "Of course Mother shall go with us! She'll go! Oh, won't we go, Mother? We'll go to the top of the continent!"

Uncle Billy stole a quick glance at pretty Aunt Jane, who flushed ever so slightly and looked down.

"Why can't we all go?" he asked. "The whole blooming family?"

Then there was pandemonium.

And that is how the Jefferson family came to make a tour of the national parks the following summer.

Father was doubtful about it at first, but he wrote to the Department of the Interior, at Washington, and

found out all about the national parks; he decided finally that the trip would be beneficial to all.

"Besides the health and the fun," he said to Mother, "I think the children will learn something about the making of the earth. I was talking the other day to Professor Grimwood. He believes the trip will teach them unconsciously a good deal of fundamental fact about botany and geology, besides developing their love of the beautiful. And it cannot help making them patriotic to see the most magnificent parts of the greatest country in the world."

Much to the children's grief, Father could not spare the time from business to go along.

"But I can get a couple of weeks or so in late August, perhaps," he said, "and I'll run out and get you and maybe see the Grand Canyon before we come home."

Little else was talked about during the spring, and many were the books that Mother read about the wonderful national parks. It was determined that they should begin with the Rocky Mountain National Park, in Colorado, as that was the nearest to their Philadelphia home.

II

THE FIRST DITCH-DIGGERS

HOW THE GLACIERS HELPED MAKE THE ROCKY MOUNTAIN NATIONAL PARK

THE Front Range of the Rocky Mountains was a delightful revelation to the women and the children of the Jefferson family, none of whom had seen mountains higher than the Catskills and the Adirondacks. Emerging, in an automobile stage, from a long and magnificent gorge through the foot-hills, they found themselves in a spacious rolling valley across whose farther horizon stretched a line of bold, purplish-gray, snow-topped mountains.

The valley was gloriously green. It was dotted with open meadows and forest patches. Graceful hills and fantastic rocky cliffs surrounded its nearer sides. Back of all, miles away, rising apparently perpendicularly from the luxuriant forest, stretched a grim background of high, snow-spattered mountains.

"Oh! Oh! Oh!" called Margaret in awed tones.

Jack stood up, shouting in his excitement. Mrs. Jefferson drew a long, quick breath; neither she nor Aunt Jane spoke. The young men were keenly in-

terested and asked many questions of the driver. After a while, as they drew rapidly into the valley, the mountains looming higher and revealing themselves in full, Uncle Billy explained.

Photograph by Wiswall Brothers

Sundown at Grand Lake

"These are not at all like the mountains in Glacier National Park," he said. "You cannot imagine anything more different. These mountains loom more. They seem more jagged. They mass heavier. At the

same time they are colored differently. They seem daintier somehow. They do not seem real to me."

"They are like a dream," said Aunt Jane quickly.

"It's more than that," cried Margaret. "It is like Fairyland."

"Same thing," said practical Jack. "Neither dreams nor fairies are real. But those mountains are real, all right. Oh, see that big bunch of them over on the left. Gee! I must climb to the tippy top of the biggest of them."

"The driver says that is the Longs Peak group," said Uncle Billy. "Longs Peak is the highest mountain of them all. It is 14,255 feet high. It can be climbed, but it is a long, hard day's work."

They swung past groups of small summer homes. A large showy hotel appeared on the right. Men and women were playing golf. Automobiles were frequently met. Many persons, singly and in parties, rode by on horseback.

"Almost everybody wears khaki suits just like mine," said Jack proudly.

"And oh," exclaimed Margaret, "there are ladies on horseback dressed just like men! They haven't any skirts at all. I don't think that is nice, do you, Aunt Jane?"

Aunt Jane flushed and said nothing.

"That's a good joke on you, Jane," laughed Mrs. Jefferson.

"What is a good joke on Aunt Jane?" demanded both children at once.

"Aunt Jane has no skirt to her new mountain riding-suit either," said Mother.

"Oh, Aunt Jane!" cried Margaret, shocked.

"You'll have to get used to that in the mountains," said Uncle Billy gayly. "Up here the ladies dress sensibly. Not only on horseback, but tramping on the trails, many women wear either very short skirts or no skirts at all."

"Circumstances alter cases, Margaret," explained Mother gently. "It is just as foolish for women to wear long skirts for mountain-climbing as it would be for bathing at Atlantic City."

They entered a straggling village of one street. Two-story shops, small frame hotels, and transportation offices lined both sides.

"What a funny little town!" said Margaret.

"This is the village of Estes Park," said Uncle Billy. "Here is where we change to our hotel bus. The hotels lie out in all directions for several miles."

"Why, I thought we were in the Rocky Mountain National Park," said Margaret, disappointed.

"The boundary-line of the Rocky Mountain National Park lies just beyond the village," said Uncle Billy. "Most of the people stay down in this lovely valley and take trips into the mountains. There are hotels up there, too."

After lunch and another automobile ride, the Jeffersons were duly installed in a straggling rustic hotel. They occupied rooms in one of many log houses clustered around the main house, where they had their meals and sat evenings around the great open fireplace. They had all the comforts and most of the luxuries of the resort hotels in the East; but here, in these apparently rude surroundings, they enjoyed also a sense of sympathy with the wild mountains which rose directly behind them.

"See those funny little squirrels!" cried Margaret as soon as they were settled. "Oh, look at that one! He isn't a bit afraid. Oh, goodness, he's coming right at me."

Jack shouted with glee.

"Just like a girl!" he exclaimed. "It's you that's afraid, not he. Besides, they are not squirrels; they're chipmunks. They're awfully tame. I'm going to throw that one a peanut."

But even Jack was startled a minute later when one of the chipmunks scampered up on his lap and took a nut from his hand.

"Who's 'fraid now?" cried Margaret.

For a long while both children forgot the mountains in their interest in the chipmunks. Jack even persuaded one to climb to his shoulder and then to his head to receive a peanut.

"Aren't they greedy?" exclaimed Margaret. "I don't see how they can eat so many nuts."

"But they don't eat them," explained Mrs. Jefferson, who had been asking questions. "See, they poke them into pockets in their cheeks and every now and then run to their homes under ground and store them away for winter."

"Just like ants," said Margaret.

Their visit to the Rocky Mountain National Park was full of the most delightful surprises. The first was the effect of altitude, for the valley where most of the hotels are situated lies from seven to nine thousand feet above sea-level. The children found that running put them out of breath quickly and that the only way they could climb the still higher mountains was to move quite slowly and rest frequently. They were much puzzled at first.

"The air is thickest at sea-level," Uncle Tom ex-

plained, "and the higher you go up, the thinner it gets, until finally there isn't any air at all. So up here, where we live a mile and a half higher than we do at home, we draw less air into our lungs with each breath. Now, running and climbing uses up more air than sitting still, so we begin to pant more quickly here than at home. When you climb up those mountains you will find the air still thinner. You will have to move more slowly yet. But it won't hurt you to do that."

Climbing the mountain-trails on horseback was another pleasant surprise. Even the ladies found that they could ride the steep and rocky trails for hours a day without special weariness.

"Don't drive your horse," said the guide. "Hold the reins loosely, but let him take his own course and pick his way to suit himself. A mountain-trained horse has only two desires in life: one of these is to follow the horse ahead, the other is to get home for dinner. I will ride ahead and keep the trail; the other horses will follow if you will only let them alone."

"But suppose he gets dizzy and falls off the rocks," said Margaret nervously. "I would rather get off and walk."

"He won't," said Uncle Billy. "A horse has no imagination. He cares for nothing but the trail, and

The Heart of the Rockies. Longs Peak from Flattop Mountain Trail

he fears nothing. If you were to walk around some of these steep places, you would become afraid and that would be the surest way to fall off and bump your head. That is because you have imagination. Leave it to the horse and you'll be all right."

The ladies, who had feared that the trails would skirt the edges of great precipices, were pleasantly surprised to find that, even when they crossed the Continental Divide over Flattop Mountain, more than twelve thousand feet above sea-level, the trail lay always a safe distance back from dangerous edges.

They lunched on Flattop Mountain.

"Uncle Billy," said Jack in an awed voice, "isn't this the top of the continent?"

"It is pretty near it, Jack," said Uncle Billy. "You will not find many spots in this world wilder than this, I imagine. These rocks back of us look like pebbles when compared with those enormous granite cliffs over there, but they are fully as big as big churches, nevertheless."

"That one must be as big as the Philadelphia City Hall," said Jack.

"I think you are right. Perhaps it is even bigger. But how little it seems when you compare it with the top of Hallett Peak, just across that chasm. Now,

Uncle Billy washed Aunt Jane's face with a handful of snow

that chasm, Jack, must be two thousand feet deep—nearly half a mile."

"And that big snow-bank; doesn't it ever melt?" asked Jack.

"No," said Uncle Billy. "It is there always. In winter it is covered much deeper with fresh snow, and as warm weather comes along the fresh snow melts off. But that much lasts always. Let's snowball."

The children were delighted with the thought of snowballing in June, and after lunch was eaten and the paper boxes that contained it were carefully burned the whole party found a couple of acres of snow in which they frolicked till even Jack was tired out. Uncle Billy washed Aunt Jane's face with a handful of snow and made her cheeks rosier than ever. Jack heaped snow upon Uncle Billy till only his head and hands emerged. Even Mother took a hearty part in the fun.

"Why, see those hens," said Margaret on their way back to the horses. "There must be a farmhouse up here."

"They're bantams," cried Jack, "but they look more like partridges or pigeons. They're just as tame—why, you can almost catch them."

"They are not chickens," said the guide, laughing. "They are ptarmigan—wild birds that live only on the high mountains. In winter they turn perfectly white, just the color of the snow."

"How funny!" cried Margaret. "Why?"

"That is what is called protective coloring," ex-

plained Uncle Tom. "When all these mountains become snow-covered, the eagles and mountain-lions could see the ptarmigan a mile away if they should remain their present dark color. So nature gives them white feathers in snow time. Then they are reasonably safe."

Another day they followed the beautiful Fall River Road to the end of Trail Ridge, and from there walked to Iceberg Lake. The view was just as fine as that from Flattop Mountain, but altogether different. They followed a trail a couple of miles along a bare lofty ridge twelve thousand five hundred feet high.

"Now," said the guide, "be careful. Take hold of my hands as we come to this precipice. It drops straight down nearly a thousand feet."

It was a timid party that approached the edge of the great precipice. A vast gulf, seemingly carved out of the solid granite, lay at their feet. Beyond it, far below, lay a superb pine-covered valley, and beyond that were other high mountains.

But the great gulf at their feet was what drew all eyes. It was semicircular in shape, and the cold granite walls were almost perpendicular. Gradually, holding hands, they advanced quite close to the edge and looked down into the depths. There they saw a lake of dark turquoise-blue on which floated large cakes of

ice. Snow-banks touched the water in places at the edges. A stream ran out of the lower end and was lost in the splendid green valley. Two eagles circled in the depths below them.

They looked silently for a long time.

"It is like looking down a well," said Jack, "but I never saw a well so big as this. Uncle Tom, how did it come to be like this?"

"Here," said Uncle Tom, "you can read the story of the glaciers. This vast bowl of solid granite is called a cirque. It was carved out by the glacier which once lay within it. Originally the cirque was nothing but a depression in a granite slope. Ice settled in the depression and froze to its rocky sides. The weight of the snows lying upon this ice began to push it down-hill, and that motion made a glacier of it. When this glacier began to slip, it pulled away some of the rock to which its edges were frozen. That undermined the slope, and the rock above split off, fell, and left a perpendicular cliff. Then the glacier froze fast to the bottom of the cliff and undermined some more rock. Of course the rock above it split off again and fell, and that made the cliff higher. In that way the glacier worked back into the granite.

"But at the same time it was pulling away the rock

frozen to its bottom, and that made the cirque deeper. So in a few million years it turned a slight hollow in a granite slope into this enormous well.

A full-grown brown bear

"All the rock which the glacier undermined and pulled away from the bottom, together with that which fell upon it from above, it carried away into that immense valley you see to the north, which is now called the Forest Canyon because of its beautiful forests. But then it was the bed of an enormous glacier of which this smaller glacier was a lesser tributary."

Not only the children but the ladies listened with intense interest.

"But what is a glacier?" asked Margaret.

"A river of ice," said Uncle Tom. "It begins in a cirque like this; just as a river of water begins in a spring or lake. This cirque is continually fed by the snows of winter; just as the spring or lake is fed by the rains. The glacier flows down through valleys; just as the river of water. It breaks into crevasses as it passes down the steep slants; just as the river of water breaks into ripples and rapids. It pours crashing over precipices in its course; just as the river of water pours over cliffs in waterfalls. Its surface rises and falls according to the snowfall of the winter before; just as the river of water rises or falls according to the wetness or the dryness of the season. It sweeps up the rocks alongside its course and carries them downstream; just as the river of water sweeps up logs and branches from its banks."

"But there is one difference," said Aunt Jane, "the glacier does not run down to the sea and the river of water does."

"But the coast glacier does," said Uncle Tom. "In Alaska and other very cold areas glaciers sometimes run all the way to the ocean, and enormous pieces

break off and float away. That is where the icebergs come from. But in inland regions like this, the glacier keeps flowing down to warmer levels until it comes to a place where ice melts. Then it turns into a river of water, which eventually finds its way to the sea. The end of a glacier is called its snout. Many of our great rivers begin at the snouts of glaciers."

"Oh!" said Margaret. "It's just like a fairy-story."

Jack said nothing, but he examined Iceberg Lake and the great cirque with deep attention.

Several days later as the party rode in automobiles in the valley near a village called Moraine Park, Jack asked:

"What a strange hill that is! It starts four or five miles back in the mountains and runs straight out into this big valley. Just look, Uncle Tom. It is the same height its whole length, and slopes off like a huge river-bank on both sides. Then it stops suddenly. Whatever made it like that?"

"That," said Uncle Tom, "is an extremely large moraine."

"What's a moraine?"

"Once," said Uncle Tom, "two huge converging glaciers flowed this way from the mountains, and joined just where that hill ends. Each followed a

valley that a stream had previously made. Each deepened and rounded out its own valley and heaped upon the valley's sides great hills of broken rock and sand, most of which it had brought down from its mountain cirque. These hills of broken rock and sand are called moraines. You see them all through the Rocky Mountain National Park. They are really the banks of the great ice-rivers of the far distant past.

"Now, this particular moraine is so big because it lies just at the point where two specially large glaciers, after flowing several miles almost side by side, united into one. Both glaciers, you see, helped to build it. When these glaciers filled the valleys with their ice current, this great moraine between them must have looked like a tongue of land, ending in a point where the glaciers joined together."

During all the rest of their stay, the children kept a sharp lookout for moraines. The Rocky Mountain National Park has many moraines. The children found it great fun to trace the courses of these ancient ice-rivers from their cirques under the precipices of the enormous Rockies far down into the valleys.

The Mills Moraine, which was built by a gigantic glacier which once flowed from Longs Peak, especially

interested them because of the big turn it makes around the base of Mount Meeker.

"Why, the glacier that made the Mills Moraine must have been a mile thick," said Jack.

Longs Peak (centre), Mount Meeker (left), and Mount Lady Washington

"Hardly that," said Uncle Tom, "but it may have been nearly half a mile thick. See the moraine. It rises a thousand or more feet."

"I want to see where it started," said Jack.

And so came about their final adventure.

Meantime, they had explored the beaver-ponds and had seen Rocky Mountain sheep grazing on the slopes of Specimen Mountain. They had climbed to the top of the Twin Sisters and had seen the Forest Ranger searching the horizon for distant fires. They had fished in Bear Lake and had visited the wonderful wild-flower gardens of Loch Vale. Longs Peak was reserved for the last.

"I cannot allow you children to go to the summit," said Mrs. Jefferson. "It may not be dangerous for men, and I know that many women climb it; but there are limits to everything, and that is where I draw the line."

Jack went into the woods to hide his disappointment, but Margaret wept aloud. Later they both admitted that Mother was right.

"Never mind, children," said Uncle Tom, "I will give up climbing to the summit. Instead, I will take you and Mother to see Chasm Lake, where that big glacier began that built up the Mills Moraine."

So, when they all dismounted from their horses one fine June morning at a little cabin hotel high up on the shoulder of Longs Peak, Mrs. Jefferson, Uncle Tom, and the children started afoot for Chasm Lake, while

Photograph by Wiswall Brothers

The precipitous face of Longs Peak from a rock shoulder 13,000 feet in altitude

Uncle Billy and Aunt Jane joined an adventurous climbing party for the summit.

They found Chasm Lake quite as wild and romantic as Iceberg Lake, but this time, instead of looking down from the top, they looked nearly straight up half a mile from the water's edge to the towering summit of Longs Peak. It was just as notable an experience, though perhaps not so startling.

"You don't feel so shivery," Margaret put it.

"In this vast well formed by Longs Peak on the west, Mount Lady Washington on the north, and Mount Meeker on the south," said Uncle Tom, "originated the mighty glacier that hollowed out that immense glacier-bed to the east of us and piled up the Mills Moraine. This is one of the finest cirques that I have seen anywhere."

And indeed the spectacle was one of extreme grandeur. The enormous granite mass of Longs Peak, rising perpendicularly above them four times the height of the Washington Monument, looked from this point of view dark and forbidding. Its summit was lost in light, fleecy clouds. The Jeffersons had seen this mountain from the valley under many varying conditions, sometimes glistening white, sometimes so delicately blue that it seemed to merge into the sky itself,

sometimes gloomy with storm-clouds, sometimes, at sunset, a rich glowing orange-red. But this was another and almost a terrifying aspect.

As they watched, the clouds thickened rapidly and dropped down into the great gulf almost to the spot where they stood. Scattering flakes of snow fell around them. Margaret shivered as they turned away, and Mrs. Jefferson looked anxious.

"I hope Billy and Jane will not meet a snow-storm on the summit," she said.

"Very likely they will have a little snow up there," said Uncle Tom. "They tell me that when it rains in the valley, it often is snowing on the summit. Clouds catch and hold the peak several times every day, and often it is snowing a little up there while down in the valley we have brilliant sunshine. But they have a good guide with them; and they tell me there have been no bad accidents."

"So they told me," said Mrs. Jefferson; but she looked worried until, an hour later, while descending the mountain, their horses brought them out again into almost a cloudless day.

The sun had long disappeared behind the higher mountains when the summit party returned to the hotel. Mrs. Jefferson gave a great sigh of relief when

she saw six or seven horses approaching from far down the road. Until then she had not realized how much she had worried.

Aunt Jane cantered ahead of the party and soon was kissing the children rapturously.

"Oh, how wonderful!" she exclaimed. "It was the greatest experience of my whole life. The climbing was harder work than I ever imagined, and it frightened one a little sometimes to climb around those steep places near the summit. But it was inexpressibly grand. And the view! Oh, that view! But wasn't it mean of Billy to leave us and come down first? What was the matter? Was the altitude too much for him?"

"Billy! Isn't he with you? He—he—isn't here," faltered Mrs. Jefferson.

"Oh!" cried Aunt Jane. "He must be here! We saw him start back ahead of us, and we didn't catch up with him—we did not see him again. He—he *must* be here!"

Aunt Jane's face paled. She clasped her hands and ran back to the approaching guide. Mrs. Jefferson ran into the hotel to find Uncle Tom.

It was true. Uncle Billy, after having successfully made the ascent with the rest, apparently started back

Photograph by W. T. Parke

Hallett Peak in July. A typical Rocky Mountain Gorge

ahead of the party. The day had been overcast. Snow was falling fast before they left. The guide saw his footprints for a few hundred yards, when they became confused with others. The guide shouted for him, and Aunt Jane expected every minute to overtake him, but she did not doubt that he had safely reached the hotel.

The guide was plainly disturbed, but others of experience pointed out that no person ever had been lost or injured during the ascent of Longs Peak. Nevertheless, the Jeffersons were greatly alarmed, and, when Uncle Billy did not return at eight o'clock, the guide was engaged to return over the trail and search for him. Uncle Tom insisted on accompanying him.

There was little sleep that night for the grown-ups. Several volunteers walked a few miles up the trail with the guide and Uncle Tom. But it was morning before Uncle Tom returned, nearly exhausted. They had found no sign of Uncle Billy; the guide had gone on to the summit.

Uncle Tom was exhausted; he was obliged to go to bed and sleep an hour or two, but several experienced mountain-climbers with another guide started up the trail after breakfast. Aunt Jane insisted on accom-

panying them, but Mrs. Jefferson remained below with the children.

And so it happened that, about noon, Aunt Jane, riding just ahead of the guide, met Uncle Billy limping on foot down the trail. He had been on the summit all night. It was not he whom they had seen start down ahead of them, but a member of another party. He had been peering over the edge of Longs Peak precipice into Chasm Lake at the time the party left, and, when he tried to follow, he could not find the trail.

"I do not know why I became so confused," he said, "for I found the trail easily enough this morning. But yesterday I was looking for it on the wrong side. It was snowing so hard that your tracks were all covered up. Then it seemed to get dark very suddenly. Then, while I was wandering around in the snow, chilled and stiff, night seemed to shut down all at once. So I gave it up and looked for a sheltered place among the rocks and crept in there.

"Do you remember, Jane, how you shared your lunch with me? Well, fortunately, I had my own still in my pocket, and, when I had eaten that, I felt very sleepy. The cold was dreadful, but I felt warmer after a lot of snow drifted over me. I held my hat

over my face, and I must have gone to sleep right away. I think I was a little dazed.

"Anyway, when I woke up and began to struggle with the snow that lay on top of me, it was early morning. I climbed out. I think my ears are frozen, and I know one foot is, for I can hardly walk. I was awfully cold. But the minute I looked around, I recognized that big rock we saw as we came up. The night wind had blown away some of the new snow, and there was the trail.

"I don't know how I ever got down through the Trough. I had to feel my way. For a long distance, over the slanting places, I went on my hands and knees and brushed the new snow away. I felt for the trail with my hands. When I saw the Keyhole, I knew I was saved, but I was almost gone then. That is what gave me heart. Otherwise, I think I should have perished right there."

The guide helped Uncle Billy on his own horse and the party descended to the hotel, where, you may be sure, he received a very warm welcome. Uncle Billy was disabled for several days, and weeks passed before he lost a slight limp.

When, a few days later, the Jeffersons left the Rocky Mountain National Park for the Mesa Verde, Longs

Peak glowed in the soft morning sunshine. Its bald slopes were a soft, delicate blue; and its summit, tipped with silver, shone in a warm red light. It was a most innocent-looking mountain.

Photograph by S. N. Leek

A large beaver family has lived here for many generations

III

THE MYSTERY OF THE MESA

NO ONE KNOWS WHAT BECAME OF THE CLIFF–DWELLERS OF THE GREEN TABLE

MAIA impatiently cut the threads of the little loom her brown, grim, silent father had made for her, and tore from it a small square of dull-red cloth which her busy fingers had loosely woven during the hot afternoon. It had been hard work. The thread had become sadly tangled a dozen times; the last time it had taken a full half-hour to straighten out.

But the cloth was fairly well made. The color, chosen from her mother's choicest stock, was warm and pretty, and the pattern, in corn yellow, was pleasing. The pattern ran from side to side across the square and, to Maia and her people, meant running

water. It was Maia's favorite pattern because it suggested what she loved best, the streams that poured down the Mesa's sides in the spring.

It was not spring now, but midsummer, and the streams had long since dried up and disappeared—all but the river miles away in the great canyon where Maia's patient brothers sometimes caught small fish which they dried in the sun for winter use. Even the river had shrunk to shallows now and the fish were few and hard to catch.

It was very hot under the low pines on the Mesa's top, and the women and most of the children had long since retired to the cool shadows of the great community house hidden under the overhanging edge of the cliffs. Only Maia, absorbed in her weaving, had remained above under the big tree, moving her loom from time to time as the shadows moved.

"Oh Sun!" she had said devoutly once when the heat seemed unbearable, "Oh, great and mighty Sun! Have mercy upon me!"

For Maia and her people worshipped the sun, which to them was God, the source of life.

Maia, her cloth square in hand, flitted across a sunny open to a straggling clump of low pine near by. Here she knelt and parted the dry grass, dis-

closing a red pottery doll lying upon a mattress of woven grasses. It was a crude little doll with rudely modelled features and square shoulders, reminding one of the Egyptian mummy-cases in museums. Staring eyes were rudely painted upon its square flat face. Its legs and arms were unshaped. One foot was missing. But Maia's face was full of adoring admiration as she gazed long at it and then tenderly lifted it and pressed it to her.

"Dolly, dear dolly," she whispered. "At last you shall have your new dress."

The sun was nearing the horizon when Maia completed the task of fitting and stitching the cloth square into the semblance of a dress for dolly. It was no such dress as clothes the doll of to-day, but it was picturesque and graceful. Maia gazed long and lovingly upon her doll. Then, with bounding heart, she started home.

As she neared the edge of the deep canyon under whose precipitous cliff was concealed, in an immense cavity in the sheer wall of rock, the city of ambitious architecture which we now call Cliff Palace, an old man wrapped in a blue rug marked with strange figures stood before her. She stopped, trembled, and dropped to the ground. But her eyes were fixed on his. Slowly

he lifted his long thin bare arm and pointed his finger at her.

"Daughter of Maius, maker of arrows, have you done your daily penance to our god the sun?"

Maia threw herself upon the ground and cried silently.

"Oh!" he said. "I thought not. Long have I watched you, evil child. Alone, I think, of all the children of our community you are careless, flippant, and irreverent. You play when you should work. Your loud laughter descends even into the kiva when our priests meet in solemn ceremony. Yesterday, absorbed in your doll, you failed to bow your head to me, the High Priest of the Almighty Sun."

"It was not my doll," said Maia tremblingly. "I was grinding the midday meal in mother's new mortar."

"You were playing," declared the High Priest. "Yes, and even this morning, playing with a bird, you saw me not."

"Its poor wing was broken," sobbed Maia. "I was trying to——"

"Silence!" said the High Priest. "What is a bird to the sun—except for sacrifice! Look across the canyon."

Maia lifted frightened eyes to a structure of new masonry which was rising above the stunted pines.

"Here, on this solemn spot, under the rays of the setting sun, within sight of that holy temple building to its honor and glory, I say to you, Daughter of Maius, that you shall do sad penance for your levity. Daily for thirty risings and settings of the sun shall you, at midday, descend even to the depths of this canyon, cross it on your knees, climb the other side, and on your knees creep to the Holy Picture which is embedded in its wall; and there shall you lie upon your face for the space of one hour, confessing your sins and begging for forgiveness and mercy."

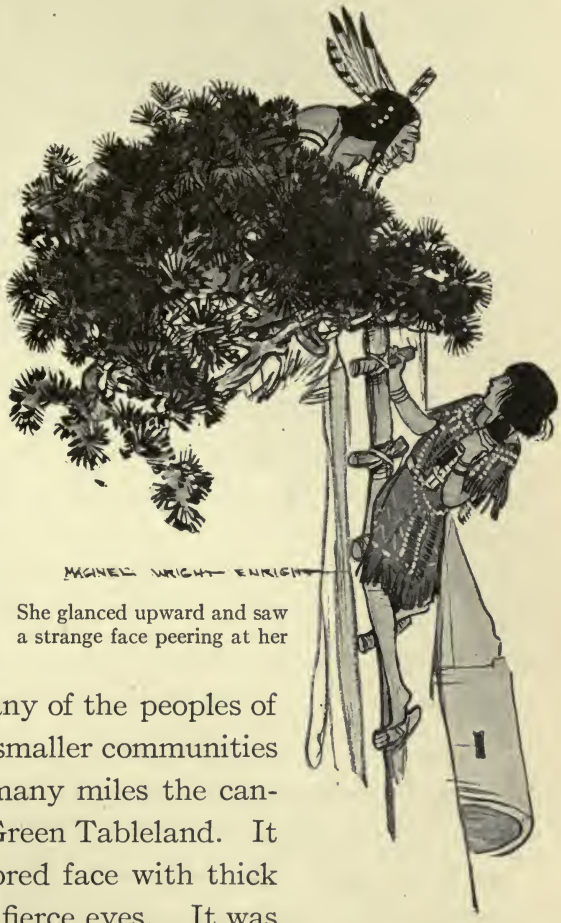
The priest vanished and presently Maia, forgetting even dolly in her distress, moved slowly to the great rock alongside of which the trail descended to the series of ladders by which the community house and the top of the Mesa were connected.

But further adventure was in store for her on this eventful day. As she grasped firmly a small pine and lowered her foot to the first rung of the top ladder she glanced upward and saw a strange face peering at her over a low bush.

Maia stopped and gazed, but the face was gone. For a moment she thought herself mistaken. But she

could not have been mistaken; the face surely had been there.

Maia remained for some time, listening. Her heart beat wildly, for this was not the face of any of her own people, and strangers came rarely and for no peaceful purpose. It was not even the face of any of the peoples of the innumerable smaller communities that dotted for many miles the canyon cliffs of the Green Tableland. It was a lighter-colored face with thick hooked nose and fierce eyes. It was daubed with streaks of brilliant paint. Yes, and it was surmounted by long eagle feathers. She felt quite sure about the feathers.



She glanced upward and saw a strange face peering at her

Maia was sadly frightened and began to descend the ladder rapidly. Then she missed dolly.

Now where was dolly? Yes, she remembered. Maia paused. Directly below her the cliff fell abruptly a thousand feet, but she thought nothing of that. What would that strange, fierce man do to dolly if he found her? That was what made Maia tremble.

It certainly was a trying question, but in the end the mother instinct triumphed. The little girl slowly ascended the ladder and crept silently up the trail. The sun had set, but the glory of painted clouds still dimly lighted the thin forest. She peered through the trees. No one was in sight. Then, in an agony of fear, she flitted silently to the spot where she had knelt before the High Priest. She felt among the dried grasses.

Ah! Here was dolly. Maia pressed her to her breast. Then she swiftly ran back to the big rock. As she reached it a dim figure leaning over the trail drew back suddenly and vanished. Maia fell headlong in sudden terror. One hand, holding dolly, sprawled over the great precipice, now gaping black as midnight. The other hand instinctively grasped and held a smooth round stick. There was a slight rustle in the bushes.

How Maia found the trail she never knew. Moving

by instinct rather than conscious memory, she passed it swiftly and began to descend the ladders. She had thrust dolly into a loose fold of her dress. Unconsciously she still held the stick in one hand. It impeded her descent, but she clung to it.

Feeling her way down several ladders, she came to the first resting-place, a mere ledge foothold. Here she paused and here first noticed the stick.

An arrow!

Yes, but what an arrow! Maia had never seen any arrow like it before. It was longer than those her father made and differently modelled. The wood was different. She could scarcely see it in the darkness, but she felt sure that such feathers grew on no birds of that neighborhood. And the arrow-head! That was shaped far differently from any her father had ever made.

Maia was puzzled and frightened. Who was that strange man with painted face who had been peering down their trail? She had heard many stories of the savage enemies who had driven her forefathers centuries before to build their cities in the safe clefts of these mighty precipices. Could there be others with him? Could they mean to creep down the ladders under cover of night and capture their community?

Maia shivered at the thought. A slight sound made her listen intently. Surely there was somebody above her. A minute later she distinctly heard the slight rattle of a ladder. Yes, some one was coming down.

Then followed other sounds. More than one was coming. Yes, many were coming.

Maia's instinct was to scream, but she stifled it. She would get home first, anyway, and alarm the community. But another thought checked her. She would find the community scattered and unprepared. The women would be making ready the evening meal. The men would be down in the deep circular kivas at devotion or council. Before she could alarm them, before the men could emerge for defense, all would be over. Their enemies would have arrived. They would be waiting at each kiva door to strike down the men one by one as they ascended.

What should she do? Surely no little girl of ten sun cycles ever was confronted by such an emergency!

The stealthy noises grew louder.

Then Maia had her inspiration.

A few months before her father had told her that the ladders upon the rest ledges were not fastened to the rocks. They were cunningly set in movable stones so they could be taken away quickly in time of

need. He had showed her how the key stone could be pushed aside, causing the ladder to drop into the canyon, leaving a gap which none could climb who did not know the finger-holes and foot-holes in the perpendicular rock. These strange enemies could not know these finger-holes and foot-holes, Maia reflected, and they could not see them in the dark.

She felt the ladder in front of her. She felt the stones at its base. But which was the key stone? Maia pushed and pulled one after another. Not one of them moved. Perhaps she was not strong enough to move the stone.

She had tried them all but one when she felt the ladder in front of her move slightly. A foot must be feeling for its top rung. Maia in her terror could restrain herself no longer. She sobbed aloud.

There was a quick movement above and low whispered words. What could she do?

The last stone! Would it never move!

Yes, it did, slowly. Maia screamed aloud as she bent all her strength to the task. Slowly the stone slipped from its place and disappeared into the black depths below. A few moments' silence and the echoes of its fall split the still night.

And then as Maia shrunk back, her strength ex-

pended, the ladder glided from its foundation and hurtled into space, and with it passed downward a dark, struggling figure. A scream came from below, followed by crashing echoes.

Revived by sheer terror, Maia seized the arrow and felt her way swiftly down the remaining ladders. Near the bottom she was met by ascending men who bore her quickly down to the stately city where an excited throng surrounded her.

"The child of evil!" exclaimed the High Priest, advancing with lifted hands.

But Maia held up the arrow, and then they knew.

And while the alarm-fires were blazing under the overhanging cliffs Maia's mother comforted Maia, and Maia comforted dolly, who, of course, must have been sadly frightened.

"Is that a true story?" Margaret demanded. "You must say it is a true story. It's just got to be true. This must be the place right here where Maia comforted dolly. I know it's true."

"And right out there on that rock," said Jack, "is where they lit the alarm-fire—just where all those other people down the canyon could see it. Say, is it true?"

Photograph by George L. Beam

The canyon seen from Balcony House

Showing the formation of the cliffs in whose occasional caves the Cliff Dwellers built their community houses

"I'm not sure," said the story-teller, laughing, "but it might be true. I heard something like it, perhaps a tradition, several years ago when I first visited the Mesa Verde National Park, and when I heard you children ask so many interested questions about the mysterious people who used to live in this wonderful Cliff Palace six hundred or a thousand years ago, I could not help telling it to you. But I'm afraid I have added a good deal to it out of my own imagination. I'm not even sure that the Mancos children had dolls."

"True or not," said Mrs. Jefferson, "you have made this spot very real to my children, and I thank you."

The Jeffersons had found the Mesa Verde so different from the Rocky Mountain National Park that every day was filled with delightful surprises. There were no lofty mountains, no snow, no glaciers. Instead, they found a dry, flat, warm country indented with picturesque canyons and carpeted with asters and thin forests of small, apparently stunted, pines. It was strangely and wonderfully beautiful.

Once, as Uncle Tom told them, it was a flat plain, but the melting snows and heavy rains of centuries of springtimes had washed most of the loose soil away until there were left only occasional elevations a thousand or two feet in height.

These elevations are called mesas, which is Spanish for tables, because they are flat on top. Most of them are quite arid, but the mesa which is the national park

Photograph by George L. Beam

Lookout Mountain, highest point in Mesa Verde

The level of the country was once the level of the top of Lookout Mountain. The canyons and the plains beyond were washed away by thousands of years of spring floods

is called the Mesa Verde because it has forests on it. Verde is Spanish for green.

The canyons or valleys which the rains have washed in the sides of the Mesa Verde became the homes of

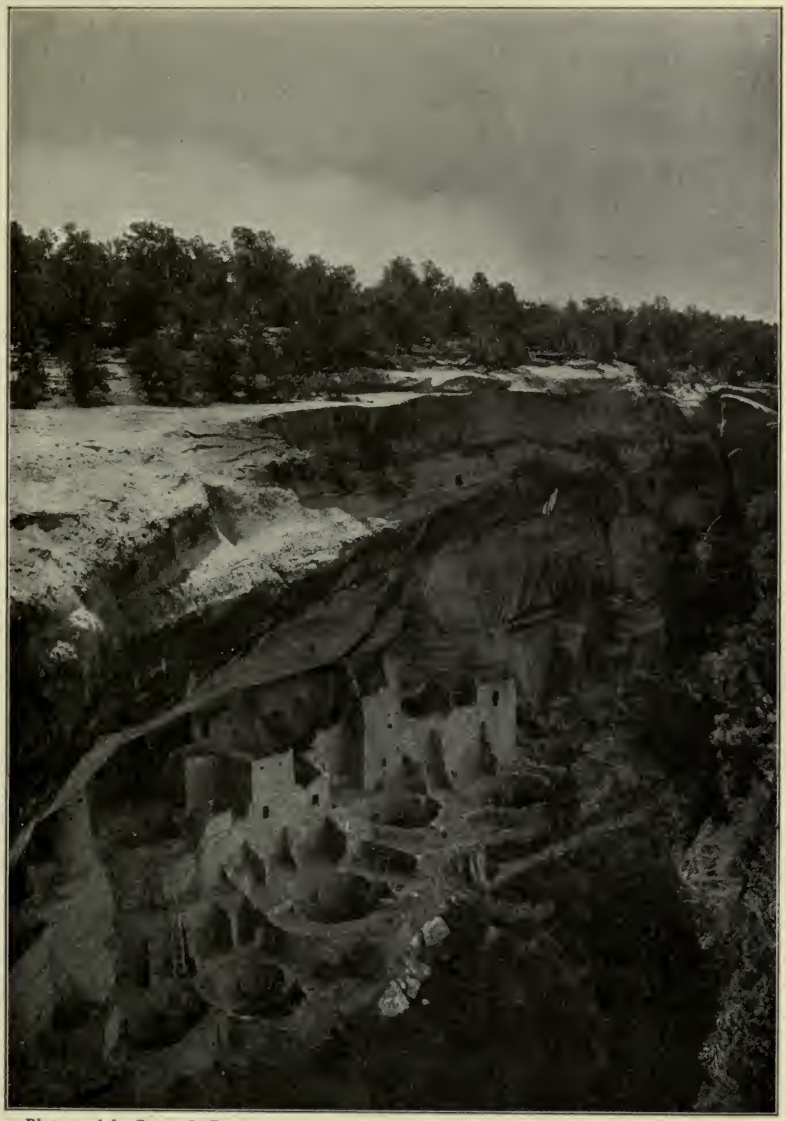
Pueblo Indians many hundreds of years ago. They built these homes high up in cavities in the cliffs, hard to reach either from above or below. That is why they were called Cliff Dwellers. There are many cliff dwellings in the southwestern part of the United States, but none so highly developed as those in the Mesa Verde. That is why it was made a national park.

"But, Uncle Tom," said Jack after a minute examination of the wonderful community dwelling known as Cliff Palace, "where did these people go? Why did they leave this nice home?"

"No one knows, Jack," said Uncle Tom. "They may have lived here for hundreds of years. They knew how to build well, as you see. They made good pottery and decorated their pots and plates with beautiful designs in rare colors. They fished in the river and raised corn on the mesas, which they cleared and irrigated. They hunted deer and other game. They became much more civilized than the Indians who lived in the east or, in fact, in any other part of the United States. Then, about six hundred years ago, they just disappeared."

"Suddenly?" asked Jack.

"No one knows that, either," said Uncle Tom. "But probably so, because the last great building they



Photograph by George L. Beam

Cliff Palace from across the canyon

Showing the overhanging cliff which protected the community from attack from above

put up was left unfinished. That building was Sun Temple. We shall see that to-morrow."

"Maybe," said Margaret, "those painted men who scared poor Maia and her dolly killed them."

"Perhaps," said Uncle Tom. "It is one of the theories about their disappearance that they were attacked by Indians from the plains and either destroyed or driven away."

"Oh, I hope," said Margaret, "that it wasn't while Maia was still alive."

"It is all a great mystery," said Uncle Tom.

After exploring Spruce Tree House, Balcony House, and several other ruins, the Jeffersons visited Sun Temple, just across a deep canyon from Cliff Palace. This great temple was never finished. They all were especially interested in a fossil palm-leaf, in a rock embedded in the foundations.

"Many thousands of years ago," said Uncle Tom, "all this southwest country was very hot, and large palms grew in the swamps."

"How do you know?" demanded Tom.

"Because some of the leaves were pressed in the mud. The mud turned into stone, and we find stones with the impress of the palm-leaves. That is one there. Now, the scientific men who study these ruins

Photograph by George L. Beam

Sun Temple. Built on top of the Mesa

Probably the last structure built. It was left unfinished when this people mysteriously and perhaps suddenly disappeared

suspect that the people who built this temple thought that that fossil palm-leaf was a picture of the sun. So they probably worshipped this fossil."

"Oh, it must be the Holy Picture!" cried Margaret, clapping her hands.

"Yes," said Uncle Tom, "I think it must be the Holy Picture."

"And right here where we stand must be where the High Priest wanted to make Maia lie on her face an hour every day."

"Probably right here," said Uncle Tom, smiling.

"Oh!" said Margaret. "I do wish we could find dolly."

Photograph by Haynes, St. Paul

One of the Yellowstone bison herds

IV

WILD ANIMALS OF GEYSERLAND

ELK, DEER, ANTELOPE, BEAR, AND BISON LIVE NATURAL LIVES IN THE YELLOWSTONE

"SEE that streak of bright pink!" cried Margaret.

"Oh! those beautiful pearly grays!" exclaimed Aunt Jane rapturously. "See how they change to darker streaks until they gradually merge into this jet-black sand right below us."

"Yes," said Mrs. Jefferson, "and over there is deep cream fading into the most brilliant white you ever saw."

"Gee!" Jack exclaimed. "That's a regular Princeton orange. Right there! See? And here's this black below us—orange and black, Princeton colors."

"And crimson for Harvard," said Uncle Billy. "Don't forget Harvard. And there's a gorgeous Amherst purple, too. It's a regular intercollegiate meet, isn't it? Only I don't see any Yale blue. How's that?"

"Vassar wins!" cried Aunt Jane, clapping her hands. "Pink and gray are everywhere!"

"And yellow, yellow, yellow—more yellow than anything else!" cried Jack. "That's my school color. Lots of schools have yellow."

"And mauve," said Mrs. Jefferson. "What college has mauve? But surely there are no schools or universities in the United States that cannot find their colors in this wonderful canyon's walls. Even green, Dartmouth's color; do you see? Such a glowing brilliant green down on those far slopes. What is it? That green isn't colored rock and sand like the rest."

"No," said Uncle Tom, "that is vegetation. It is manzanita, surely—yes, and scrub-pine. Look at it through the glasses."

"And while you are talking of green," said Mar-

Photograph by Gifford

The Grand Canyon of the Yellowstone and the Great Fall

garet, "do not miss that green and white river down there."

"That river," said Uncle Tom, "is a thousand feet below where we stand. It is very deep and swift. The Great Fall up-stream there is twice as high as Niagara Falls."

"Goodness!" cried Margaret. "It doesn't seem so high."

"It is because it is two miles away," said Uncle Tom. "Then, too, this Grand Canyon of the Yellowstone is so vast that even the biggest things seem small. Of course, it is not nearly so big as the Grand Canyon of the Colorado River, in Arizona; nevertheless there is no canyon in the world that equals this one for the immense variety and delicacy of its colors."

"I understand why they call it the Yellowstone, all right," said Jack. "It's mostly all yellow."

"Moran's big painting in the Capitol at Washington shows it practically all yellow," said Uncle Tom. "And so it is when you look at it as a whole. It is only when we look right down into it that we can see the thousand other shades and tints of the rock and sand."

"I don't wonder they call this spot Inspiration Point," said Aunt Jane.

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Upper Fall of the Yellowstone

"There's your Yale blue," cried Jack suddenly.

"Where? Where?" they all asked, gazing downward into the depths.

"Look up," said Jack.

They all looked up at the azure canopy of sky covering the whole gorgeous spectacle.

"That completes it," said Mrs. Jefferson after a silence. "There seems now to be no color or shade of color missing. My brain is fairly gorged with color."

"Just like another part of you feels after Thanksgiving dinner," said Jack, and Margaret squealed appreciatively.

This was their first day in the Yellowstone National Park. They had come in through the eastern entrance and had seen the wonderful Shoshone Dam and beautiful Sylvan Pass on the way. They had stayed over night at a large hotel and had spent the morning looking at the surging Yellowstone River and the Upper Fall. Then, after luncheon, they had walked down to Inspiration Point to revel till sunset in the magnificence of the painted canyon.

As they walked slowly home a young man passed them bending under a large, partly filled sack. He carried a fishing-rod in his hand.

"He's making believe that his potatoes are trout," said Jack jeeringly. They all laughed.

"Let's have some fun with him," said Uncle Billy with a wink. "Say, my friend, you've had good luck, haven't you?"

"Only fair," said the man, dropping his sack and wiping his forehead wearily. "It was stiffish work lugging these fish up from the river. I climbed too fast and I'm nearly all in."

"Do you mean to state that your sack is full of trout?" demanded Uncle Billy sharply. "Let's see them."

"They ain't so many," said the angler apologetically, "only nine, but they're fairish size."

He emptied his sack on the grass. Sure enough it contained nothing but trout.

"Gosh!" said Jack, and the two uncles knelt on the grass and examined the fish.

"Not much like the trout we caught in the Adirondacks last summer, Jack," said Uncle Billy. "The smallest of these must weigh a couple of pounds."

"No," said the angler, "that little feller doesn't weight more'n a pound and a half. You see he's slim. All these Yellowstone River trout are slim. But these others run two and a half or three pound each, and that big feller weighs five pound easy."

"And did you catch these huge things with that tiny rod?" demanded Margaret.

"That's where the fun comes," said the man, grinning. "I got 'em down in that frothy water. I thought I never would land that big feller. I followed him more'n half a mile down-stream and onct I got into the water near up to my elbows. I thought I was a goner for a minute or two, for the water was fast right there. But I held onto a rock and held the fish, too, till somehow I got back ashore. That's where the fun comes in, little girl. It ain't the fish; it's the gettin' 'em."

"I'd rather catch sunfish," said Margaret with a shiver; but Jack's eyes shone with excitement and the two uncles exchanged meaning glances.

The next day, after a steamer ride on Yellowstone Lake and a near-by glimpse of several white pelicans, one of which, standing on the shore, appeared quite as tall as Margaret, they visited the geysers. The children were silent with astonishment at the vast quantities of hot water which Old Faithful spouted nearly two hundred feet into the air.

"But what makes it spout?" Margaret finally asked. "Is it a big fire-engine?"

They all laughed, and Jack jeered loudly.

Photograph by Haynes, St. Paul

The Old Faithful geyser spouts every seventy minutes

"Well, Jack," said Mrs. Jefferson, "you seem to think that very funny. Suppose, then, you tell Margaret what makes Old Faithful spout?"

"Why," said Jack, as the whole party turned smilingly for his explanation, "why—why—it just spouts, don't you see?"

And Jack grew red and uncomfortable as all laughed heartily.

"Smarty!" cried Margaret triumphantly. She capered around him, pointing her finger tauntingly.

Uncle Tom checked Jack's sharp retort.

"Children," he said, "I don't think that any of you, even wise Mother, can answer that question. I looked it up in the encyclopædia before I left home, or I shouldn't have known, myself. Listen, and I'll try to tell you."

They all gathered around.

"Thousands of feet deep in the earth below us," said Uncle Tom slowly, "perhaps very many thousands of feet, the rocks are excessively hot, so hot that they instantly make water boil. Down among these hot rocks, right under Old Faithful, there is a cave, perhaps as big as a very large room, and from the top of that cave a vent or long hole, perhaps three or four feet in diameter, leads all the way up through the earth into

Old Faithful. It is out of the upper end of that long hole that the water spouts.

"Now, there are springs far down in the earth that empty their cold water into that hot cave. As fast as the water pours into the cave, it boils up and fills the long vent-hole above with heated water.

"Now stop and get that into your heads.

"But new spring-water is pouring into the cave all the time and this water turns rapidly into steam. Now, you know that when steam is compressed, as in the cylinder of a locomotive, it acquires tremendous force. So this steam in the hot cave, which is pressed down by the weight of the water in the vent-hole above, and pressed up all the time by the new steam from the heated rocks below, finally cannot stand the pressure any longer and just hurls that heavy weight of water overhead right up and out. That is what makes the geyser spout."

"It's like on a warm night I just can't stand the bedclothes any longer and kick them on the floor," said Jack intelligently.

"Something like that," said Uncle Tom. "Margaret, do you understand it now?"

Margaret shook her head.

"Listen, Margaret," said Aunt Jane. "Haven't you

seen the steam in the kettle on the gas-stove at home get so hot that suddenly it blows the lid off?"

Margaret nodded, her eyes brightening.

"Well, a geyser is just like that," said Aunt Jane. "The hot rocks are like the gas-stove; the cave is like the kettle; and the water in the vent-hole is like the lid."

"Oh, I see! I see!" cried Margaret, dancing. "A geyser is just a kind of a big teakettle—but I'll bet that Jack doesn't understand it yet."

Jack glanced at her contemptuously.

"A boy always understands more than a girl," he said. "I understood it long before you did."

And Uncle Tom had to intervene again by pointing out other geysers spouting in the distance.

"There are several hundred geysers here in the Yellowstone," he said. "Some of them are very large and only spout at intervals of weeks or months. Old Faithful here spouts every seventy minutes. Some of the little ones spout every few minutes. The mud-volcano you saw this morning is nothing more than a small geyser whose vent is filled with soft watery mud instead of water."

But, after all was said and seen, the most popular feature with the children was the Yellowstone's wealth

Photograph by Schlechten, Bozeman

Blacktail fawn

of wild animal life. They counted more than eighty deer on their third day, which they spent riding horses over the trails in the northwestern part of the park. Then they lost count.

"They're just as tame as sheep," said Margaret, as

a large buck and two does lifted their heads above a mass of low bushes scarcely a hundred yards from the trail. The deer watched them pass and resumed their grazing.

"One of the rangers told me," said Mrs. Jefferson, "that in the autumn, after most of the tourists go, the deer flock to the hotels to feed on the lawns. Some of them walk up the porch steps and take grass and flowers from your hand. They have no fear at all."

"A man in the hotel," said Uncle Billy, "told me last night that he was one of a large supper-party in a bungalow in the northern part of the park when a doe came in through the open door and walked entirely round the table."

"Why are they so tame here?" asked Margaret. "You told me yourself, Uncle Billy, that when you went hunting in the Adirondacks you could hardly get near enough to a deer to shoot."

"That," put in Uncle Tom, "is because no shooting is permitted in any of the national parks. The Yellowstone was made a national park in 1872, and in 1894 a law was made prohibiting all shooting. Since then many kinds of wild animals have increased greatly in number, and have lost nearly all their fear; people do not hurt them here and so the animals have become quite neighborly."

"But I want to shoot them," said Jack. "I want to shoot a bear."

"You'd be afraid," said Margaret.

"I wouldn't," said Jack. "I'd go right up to a bear just as quickly as I'd go up to any—oh!"

Jack, who was riding ahead, stopped suddenly. Then he drew a sharp wavering breath and turned his horse.

"Run," he whispered hoarsely. "Run! Quick! Quick! Here, let me pass!"

"What's the matter?" asked Mrs. Jefferson nervously.

"Leggo my horse!" shouted Jack to Uncle Billy, who had grasped his reins as he tried to push past. "Here you, stop that. I want to get away. Don't you see them? Hurry! hurry! Oh, quick!"

The party drew rein and looked into the woods just ahead. Under the trees several hundred yards away sat a large black bear and two cubs.

"Oh, Mother, look at those cunning little bears," cried Margaret. "They're playing with something that moves in the grass. And look! look! See that one climb the tree. Oh, isn't that too cunning for anything?"

The guide, who had been removing a pebble from his horse's foot, now rejoined them.

"How near will it be safe to approach?" asked Uncle Billy.

"It is safe enough," said the guide. "But you stay here and let me see how near I can get before they run away."

He dismounted and, holding a lump of sugar between his fingers, slowly moved toward the bears. Mother bear instantly became alert, watching his every movement with sharp, interested eyes. As he neared them the guide moved slower and slower. Presently he scarcely seemed to move. The cubs, absorbed in play, did not notice him, but their mother rose slowly and regarded him with deepest attention. He did not seem to look at her, though really he watched her closely. He approached the cubs and stood silent for some minutes. When he threw a lump of sugar to the cubs, mother bear rose swiftly upon all fours but, as he made no other movement, she remained still.

But not the cubs. One of them saw the sugar, smelled it, licked it, and then ate it greedily. He tossed another lump and another. Each fell nearer to him, until the cubs were almost within reach. Mother bear watched intently. So did the Jeffersons back on the trail.

Ten minutes later the cubs were standing erect,

eating sugar from the guide's hand, and mother bear, now satisfied that no harm was meant, was again quietly seated.

"Let me go feed the baby bears," said Margaret.

Photograph by S. N. Leek

There are thirty thousand elk in the Yellowstone

"No," said Mrs. Jefferson sharply. "You will stay right here."

Jack asked no permission. He slipped from his horse and started for the guide, but Uncle Tom's firm hand grasped his arm.

"None of that," he said sternly. "Get on your horse."

"It's best not to fool with bears," said the guide on his return. "Some tourists feed them, but they oughtn't to. They don't know bears. It's different with us. We know them."

Moving slowly and quite silently over the trails they saw many wild animals that day. Dozens of sturdy elk loped silently away at their approach. A large moose entered the trail a couple of hundred yards in front of them and did not hurry when he saw them. On a not distant hillside they saw a band of antelope. There were smaller animals, too. They saw three foxes and a coyote.

"In very heavy winters when food is scarce in the mountains because of the heavy snows," said the guide, "the park rangers scatter hay in the valleys. Thousands of deer and elk and hundreds of Rocky Mountain sheep come down to feed. They are especially tame then. Many times I have actually touched the sheep, which are usually the most timid of all our animals."

"All of which," said Uncle Tom, "merely proves that wild animals naturally are friendly. They fear men only when men are cruel and murderous."

For several days Margaret thought and talked of little else besides the baby bears. Chipmunks ceased

to interest her and even a young doe which her mother coaxed with a bunch of flowers nearly within reach failed to arouse her usual enthusiasm. Meantime they

Photograph by Gifford

Many families camp all summer

had lived part of the time in the large luxurious hotels and part of the time in the public camps. Jack preferred the camps. He liked to sleep in the tents, and the big fires which the camp managers built under the trees in the evenings fascinated him. Several days

were spent on horseback on the trails. The two uncles fished with some success; once they took Jack but, as he caught no trout, he preferred afterward to stay with Margaret. They saw more of the geysers and the hot springs. Once they bathed in the hot-water swimming-pool during a hail-storm, which so battered their heads that they were glad to hurry out.

One sleepy afternoon while the uncles were fishing and the ladies napping in a tent, Jack wandered down the road to talk with a park ranger. Margaret finished her story-book and ran back in the woods for wild flowers. She lay down under a tree and fell asleep.

Waking in the shadows of late afternoon, she sat up suddenly with the consciousness of stealthy noises near at hand. What they were she did not know, but she was frightened. At first she thought dogs were growling playfully, but instantly she knew that no dog uttered the sounds she heard.

Rising slowly and with beating heart she peered around a tree-trunk and gavê a low cry of surprise, pleasure, and alarm, for only a few feet away two bear cubs were rolling over each other in play.

Margaret was frightened at first. She did not dare run. She scarcely dared breathe. But there was no

large bear in sight and after a while her pleasure in the play overcame all other feelings.

"Oh, if I only had some sugar!" she whispered to

Photograph by Edward S. Curtis

Yellowstone hot-water formations beautifully colored by microscopic vegetable algæ

herself. "I wonder if I just couldn't touch that littlest one just once."

So she stole slowly toward them, just as she had seen the guide do a few days before. The cubs were wrestling quietly, both prone on the ground, and did not see or scent her. She got down on her knees and

crept faster toward them, one hand outstretched and her heart beating in expectation. She felt very daring, and so indeed she was, far more daring, in fact, than she could have known. The cubs played on unsuspectingly, each trying to bite the other's ear.

Margaret's outstretched hand was within a few inches of the nearest cub when a dry stick snapped sharply under her knee. Then everything happened at once.

Both cubs jumped up quickly and one rolled over fairly upon Margaret's head. She screamed and struggled to her feet. She saw both cubs scrambling madly up a tree. She also heard a short, sharp growl and the crash of breaking bushes. A great shaggy, brown head with staring eyes, hanging jaws, and glistening white teeth pushed swiftly into view not a hundred feet away.

Margaret screamed wildly and ran as she had never run before. She heard a snort behind her and fast padding footsteps. She miraculously escaped the trees as she ran. A few moments later she was sobbing in Uncle Billy's arms.

Great excitement, of course, had followed the discovery of Margaret's disappearance. The camp was aroused and a score of searchers invaded the woods in all directions. Uncle Billy was searching the near-by

Margaret screamed wildly and ran as she had never run before

woods when Margaret's scream drew him running to the spot. Uncle Billy saw the mother bear standing at a distance. She probably had followed Margaret only a few steps. After a few moments, assured of her cubs' safety, she returned slowly to them.

It was a long time before the frightened little girl was comforted. According to her story the mother bear was as big as the elephant in the Philadelphia Zoo; it was noticeable that Jack did not offer to go back into the woods and shoot her.

Around the camp-fire that night Margaret had to tell her story many times. She felt herself quite a heroine. When Mrs. Jefferson tucked her into her warm bed and gave her many good-night kisses, not unmingled with loving tears, Margaret said:

"Well, Mother, anyway, I've touched a really, truly live wild bear, haven't I?"

"But Mother's little girl will never, never do anything like that again, will she? Promise Mother."

"Yes, Mother, I——"

But Margaret was asleep.

Mountain-sheep

V

THE EDUCATION OF ROCKY M. GOAT, JR.

NO OTHER SCHOOLHOUSE IN THE WORLD IS MORE BEAUTIFUL THAN THE GLACIER NATIONAL PARK

"WHERE? Where? I can't see any little white spot that moves."

Margaret jumped up and down excitedly. "Where? Oh, tell me where to look. I *must* see that little white spot that moves. Tell me! Tell me where!"

"I can't tell you now," said Uncle Tom, "for the spot has vanished. But I can tell you a story about another little white spot just like that one."

"Oh, it's just too mean that I haven't seen one yet!"

cried Margaret. "But look! Look! See where Uncle Billy and Mother and Auntie have got to!"

"Gee," said Jack, "they're most up to the glacier. It was awful mean of them to leave us behind."

"Not a bit of it," retorted Uncle Tom. "On Blackfeet Glacier the other day you nearly fell into a crevasse. That was quite enough excitement for one summer. But sit down on this grass and listen to my story."

The children sat down beside a glassy lake which reflected the broad stretch of blue-white ice upon a sloping shelf of rock hundreds of feet above its surface. Two snow-spattered mountains rose above it, one on either hand.

"That's some glacier," said Jack admiringly. "Say, Uncle Tom, those rocks look awfully old, don't they? They are gray and wrinkled and all cut up into seams and cracks just like that old Indian we saw at the station when we came in. They must be just terribly old."

"Yes, Jack, they are," said Uncle Tom, "they are almost the oldest rock in the world. Do you know how the Glacier National Park was made?"

"No, how?" asked the children together.

"Well, you know already that many people still

think that the earth was once a vast globe of hot gas, and that it became solid and much smaller as it cooled."

"Yes, I know," said Margaret, looking very wise indeed. "Heat expands and cold contracts."

"Modern geologists," continued Uncle Tom, "think that the earth never was gaseous, but a big globe of loose rock, the outside skin of which, as the ages passed, settled of its own weight into the hard, solid thing it is to-day. In either case the inside contracted and became too small, here and there, for the skin. Naturally the skin cracked—just as an orange-skin sometimes does when you suck the juice out. Then one edge of the cracked part got squeezed up and pushed over the other edge. That happened right here in what is now Glacier National Park."

"It must have scared the people who were spending the summer here," said big-eyed Margaret, greatly interested.

"Oh, bless you, child," said Uncle Tom, "there were no people living anywhere in the world then. That was long before God made Adam and Eve. That was millions of years ago."

"*Millions* of years?" asked Margaret.

"Yes, millions, many millions. Perhaps fifty, sixty, a hundred millions of years ago. No one knows. Any-

way, after this edge was pushed over the other one, the rains and the frosts began to chisel and carve it.

"How? I'll tell you. In the summer the water soaked down into all the tiny cracks and in the winter froze up tight. Now, when water turns into ice it expands just a trifle; so, when the rain-water froze in the cracks, the ice forced the cracks wider open. After a while flakes and chunks of rock loosened and broke off and the next summer's rains and freshets washed them away. Jack Frost is a wonderful sculptor. It is he who has carved these mountains with his millions of millions of tiny icy chisels.

"At first this great overthrust edge stood up bare and shapeless. Probably it was many miles thick. But after Jack Frost had worked upon it for a few centuries, the top wore off. Jack Frost is a busy fellow. He never stops to play or sleep. He worked on this overthrust for centuries of centuries; for thousands of thousands of years; for many times thousands of thousands of years. And during this tremendous period, whose length no human mind can grasp, all of the enormous bulk of overthrust rock was chiselled out and washed away except the very bottom layer.

"Now, this bottom layer was, of course, the very oldest of all the rock. It belongs to a period which

geologists call the Algonkian. Once, before it was hoisted so far up in the air, it was the bottom of a sea. And that is why it looks so very old—simply because it really is one of the oldest rocks there is."

Photograph by Fred H. Kiser

Western end of St. Mary Lake

Citadel Mountain in left centre is typical of the erosional mountain shapes everywhere common. Erosion has made a cone of Fusillade Mountain, on its right

"Gee, but that's interesting!" said Jack. "Was there any life at all when that rock was made?"

"Maybe there were just the beginnings of life," said Uncle Tom. "But there were no animals or trees.

Most of the living things of those far times were too little to be seen without a microscope."

"Uncle Tom," asked Jack, "why are there so many lakes in Glacier? And what makes the mountains such queer shapes? A lot of them make me think of that keel-boat of Uncle Billy's when he turned it upside down for the winter."

"First of all, Jack," Uncle Tom replied, "because the rock is principally sandstone and limestone, which are both softer than the granite in the Rocky Mountain National Park; and next because these rocks have been exposed to the frosts and the rains for so many millions of years. For these two reasons the glaciers have cut deeper cirques and valleys and have gouged out bigger precipices and more and larger lakes. For the same reasons the mountains have worn away into those strange shapes you speak of. The lakes and mountains of Glacier National Park are the most romantically beautiful in the world because they are surrounded by such magnificently carved mountains. Jack Frost has had softer material to work with and more time to spend upon his carving."

"But aren't you going to tell us that story about the other little white spot?" asked Margaret.

"Of course I am," said Uncle Tom. "The scene of

the story is right here where we are sitting. Do you see that horizontal ledge up there on the side of Mount Grinnell? How high up do you think that is?"

Neither of the children could tell.

"Well, that is probably more than two thousand feet—say, half a mile—higher than this lake. If twenty steeples as high as our church-steeple at home were set one on top of the other it would not reach so high. You will notice that the rock from that ledge seems to drop straight down."

"It *does* drop straight down," asserted Jack, "just as straight as a house."

"Well," said Uncle Tom, "how would you like to have been born up on that ledge?"

"Oh, goodness!" cried Margaret. "And be a little baby up there? And creep out and fall off? No, sir! But nobody ever was born up there, Uncle Tom; really?"

"Little Rocky was born in a cave back of that ledge," asserted Uncle Tom. "The ledge was his front yard; and it had no fence, either. Mrs. Rocky Mountain Goat, his mother, was a nice, timid, mild-eyed lady who wore long white furs all the time, summer as well as winter. His daddy, Mr. Goat, had a straight white beard and big staring eyes. He looked very like old Mr. O'Reilly who keeps the candy stand near your

school, Jack. Only his face was as white as a clown's, and he dressed in white from head to foot. The long hair on his legs stopped a good deal short of his feet, just like Mr. O'Reilly's Sunday trousers. Mr. Goat had funny short horns sticking straight up out of his funny long head. I'm afraid he was a queer-looking person, but Mrs. Goat thought him very handsome; and, as for little Rocky, he thought Dad the most wonderful creature in all the world.

"Now, when Rocky was big enough to go out upon the ledge where his parents cropped grass and wild flowers all day, his father led him to the edge and told him to look over. Rocky did so. A thousand feet below him enormous rocks—see them there?—threatened him in case he should fall. But he was not afraid because he never thought of falling. His father and mother were not afraid; so why should he fear?

"Later on his father led him out to the edge of still greater precipices and taught him to leap across chasms and jump up and down to other ledges. In these leaps, Rocky's little body often would momentarily pass across chasms a quarter of a mile or more deep, but he had no more sense of danger than you children have in ascending some high office-building in an elevator.

"Remember that fear is almost wholly a thing of the imagination. The same persons who are terrified by the sight of harmless snakes often have no fear whatever of germs which are exceedingly dangerous and deadly. Rocky was fearless because no one had ever suggested to him the possibility of his falling. And, because he had never feared falling, his chances of ever falling became very small. Fearlessness, courage—this is what enabled Rocky to leap across the dizziest gulf, and what will enable you children to do most of the things you want to do in life.

"But Rocky's life was not all spent upon the ledges. Sometimes his parents took him down to those beautiful wild-flowered slopes by the glacier's side; but they did not do this often while he was still very small for fear of the lions."

"Lions? Not really!" cried Margaret, and Jack looked up with sudden interest.

"Yes, indeed," said Uncle Tom, "but not the kind of lions you have seen in the zoo. Those live only in hot countries. The American mountain-lion is a large and ferocious brute that does not fear the cold. In fact, his home is in the coldest regions in the United States. When the snow is many feet deep in the valleys and the thermometer is fifty or sixty degrees

below zero, Mr. Lion goes out hunting for the goats and the deer that serve the same purpose for him that roast beef and broiled chops do for you.

"Now, Mr. Goat was a powerful and fearless fellow, and taught little Rocky many things about getting along in the world. He taught him where to find the salt-licks, for animals need salt just as much as you need it, but they do not need it so often. He taught him to go to the licks at times when he was least likely to find lions waiting under near-by bushes. He taught him how to jump down a precipice and alight on some small ledge with all four feet held together, and from there leap to another ledge lower down. In fact, little Rocky's sturdy father gave him the best possible education in the art of making a living and escaping his enemies in a land where living was difficult.

"But Rocky learned many other useful things that his father could not teach him. Uncle Waggletoe, his father's older brother, was a very wise old goat. He had not been content to graze in one neighborhood like most goats. He had, indeed, travelled over all the neighboring mountains for many miles around. He had asked countless questions of the mountain-sheep and the eagles and the smaller animals and

Uncle Waggletoe

A lucky snapshot. Rocky Mountain goats seldom come within near-camera range

birds whom he had met on his travels. He was, indeed, a wise old goat."

"Why did they call him Uncle Waggletoe?" asked Margaret.

"For the same reason that we call you Margaret," said Uncle Tom, "because it was his name."

Jack laughed and Margaret pouted.

"The fact is," said Uncle Tom, "that Uncle Waggletoe had a curious habit of shaking his left hind foot whenever anything interested him greatly. That is what gave him his name. You will hear presently how this habit served him a very good turn.

"One day when Rocky was a vigorous youngster who could leap farther and butt harder than any other young bucks of his own age, Uncle Waggletoe and Daddy Goat had a long and earnest conversation on the top of a lofty precipice looking down upon Iceberg Lake. At its close they trotted gravely for a quarter mile down a slanting ledge, leaped from there to the next lower and so on till they joined a group of several families gossiping idly in the sunshine near the water's edge. Mr. Goat called Rocky from a wrestling-bout with a visiting kid from Mount Wilbur and said solemnly:

"'Rocky, Uncle Waggletoe thinks you ought to

travel. I never travelled, myself, and I always have been well, happy, and safe. On the other hand, he was a great traveller in his youth. He has seen the mountains of Canada and the plains of the Blackfeet. He has even drunk of the swift waters of the Flathead. He has had many adventures and several narrow escapes. Perhaps travel has broadened and improved him. Many say so. Your Uncle Waggletoe is much respected. He has offered to show you the world, and I have consented. You see,' he added, lowering his voice, 'your Uncle Waggletoe's influence is undoubtedly greater for his having travelled. People think he is a much more important goat than really he is. I don't much believe in travel myself, but certainly it is a cheap and easy way to make a reputation.' And Mr. Goat winked one eye solemnly.

"From which you will perceive, children, that Uncle Waggletoe was not the only wise old goat in the Iceberg Gorge that morning.

"They started early one spring morning from Iceberg Lake. More than a hundred white goats, young and old, great and small, gathered on the ledges to bid them farewell.

"'In all Goatland, my dear Rocky,' said Uncle Waggletoe, 'you will see nothing grander than this

"'In all Goatland, my dear Rocky,' said Uncle Waggletoe, 'you will see nothing grander than this spot.'"

spot. That glacier slanting sharply down the mountain-side and splitting off ice chunks into the water is not so large as many you will see, but it is very, very wonderful. An eagle once told me that he had seen a place called Mount Rainier where the glaciers were hundreds of times as long as this and the ice as thick as the Garden Wall is high. But eagles are such liars!' Uncle Waggletoe sighed.

"Now, I am not going to describe their travels, for that would take too long. They were away all summer, and they saw most of the magnificent mountain country which we

call the Glacier National Park. They crossed the Continental Divide, not by the beautiful Swiftcurrent Pass which we shall cross to-morrow on horseback, but right up over the Garden Wall. They skirted the crests of giant heights and stood on the top of Mount Cleveland, the loftiest peak in the park, from which they looked upon one of the noblest mountain spectacles in the whole world. South of them the McDonald Valley, framed in ice-topped mountains, wound its magnificent course through distant passes to placid forest-bordered Lake McDonald. Thousands of feet below them lay the broad green Waterton Valley, dotted with lakes and backed by splendid glacier-shrouded heights. To the north lay the lesser Canadian Rockies.

" 'I did not know the world could be so big,' gasped Rocky.

" 'Those strange men-creatures that walk on their hind legs and ride horses,' said Uncle Waggletoe, 'seldom come up here. That is why I like it here. They are getting too plentiful at Lake McDermott and Iceberg Lake for my comfort. Of course they never kill us as they used to do. Your father thinks we are quite safe; but, frankly, I should feel safer if we all moved up here.'

" 'Did they ever kill us?' cried Rocky, aghast.

"'Did they? Well, they did, indeed,' said Uncle Waggletoe. 'Many years ago when my father was a young buck like you, they used to point magic sticks at us that made noises like rocks dropping from precipices. Every time that noise was heard a goat died. Then they would climb up and get his poor body. We never could understand why. Sometimes we would find blackened sticks where a fire had been burning and bones lying near it. Perhaps they ate goats; we never knew. It seemed strange that we never found goats' heads and skins. I think they must have eaten the heads and skins. But lions don't do that; we never could understand.'

"'But don't they point magic sticks at us any more?' asked Rocky nervously.

"'They have not done so for many years.'

"'Perhaps they have lost the sticks,' Rocky suggested.

"'No,' said Uncle Waggletoe, 'they still have them, and sometimes they point them at lions. That is what makes your father think they have become our friends. They do not kill any animals nowadays but lions.'

"They travelled west across the Divide and descended between bleak white glaciers to the most beautiful water that Rocky ever had seen.

Photograph by Fred H. Kiser

Avalanche Lake under the Sperry Glacier

"'I don't like to come down as far as this,' said Uncle Waggletoe, 'but I want you to see Lake Bowman close by. There is nothing finer in all Goatland.'

"Then they travelled south to the largest sheet of water Rocky had ever seen.

"'Lake McDonald is getting spoiled,' said Uncle Waggletoe, shaking his whiskers sadly. 'Too many men here. Look at that big house where they meet. There's a second group of houses down the lake and still another group at the head of the lake. And now they have houses floating on the water. Do you see that one? It moves as fast as a bird. No, I'm going back to Mount Cleveland.'

"'But why?' asked Rocky. 'These creatures do not kill us any more. You say they are our friends. If they are our friends why should we run away? The fact is, I rather like to see them moving around. They are interesting.'

"Uncle Waggletoe gazed solemnly at his nephew for a long while. Then he wagged his head slowly and said:

"'New times, new ideas. You young fellows actually will tolerate these queer hind-legged creatures, eh? But look there at that deer, quick!'

"His left hind foot wagged rapidly.

"Rocky looked at the big house by the lake side.

A deer had come out of the woods and was walking calmly up to the door. A group of children ran out and patted its head and stroked its brown sides.

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Gunsight Lake east from Gunsight Pass

Their gay shouts resounded across the water. Uncle Waggletoe's left hind foot wagged harder than ever.

"'Scandalous!' he cried. 'There is your new spirit for you! A disgraceful spectacle, I call that. I thought better of deer. I did not think they would deliberately associate with these men-creatures.'

"But Rocky's eyes were glistening. If goats can smile, I am sure he was smiling then.

" 'No, no, Uncle Waggletoe, I don't agree with you. I think those little baby men are cunning. I think—I'd—like—to—to—have them pat me.'

"Uncle Waggletoe bowed his head in shame. For a long while he was silent. Then he groaned:

" 'I'm afraid my time has come. I cannot understand these new ideas. I think next year I shall go to Mount Cleveland and spend my remaining days in solitude.'

"The next day they stood on the cliffs above Lake Margaret Wilson and watched its waters cascade twelve hundred feet into a hidden lake below. They crossed magnificent Gunsight Pass, they looked down upon beautiful Saint Mary Lake, spoiled in Uncle Waggletoe's eyes (but not in Rocky's) by the picturesque and luxurious chalets built upon its banks; and then, from the summit of Rising Wolf Mountain, they looked over upon the wonderful beauty of Two Medicine Lake and out upon the broad plains where the Blackfeet Indians, once so warlike, now work their peaceful farms.

" 'I'll say this much for the new times,' said Uncle Waggletoe, 'that those Indians don't hunt us any more.

Photograph by Fred H. Kiser

Going-to-the-Sun Mountain, St. Mary Lake

Legend has it that a god who visited the Indians returned to Heaven from this summit

Grandfather Crookedhorn used to tell me stories of the time when they dressed in furs and feathers and chased us all over these mountains. They don't come up here much now, and, when they do, they let us alone.'

"'Near the summit of lofty Mount Stimson, Uncle Waggletoe met an old friend whom he had not seen for many summers.

"'Well, if it isn't Daddy Shortbreeches!' he cried, rubbing noses with a goat of venerable countenance. 'And who are these with you? Your grandchildren?'

"'I'm showing them the world,' said Daddy Shortbreeches. They talked long together.

"Meantime Rocky leaped upon a ledge on which was perched a graceful young goat.

"'Kid, your eyes shine like the stars,' he said. 'What is your name?'

"'My name is Flower-Bright,' she said. 'Your eyes shine, too, and your young beard is whiter than the daisy's petal.'

"This was Rocky's wooing. But he did not see Flower-Bright again until the next spring when her grandfather brought her to him at Grinnell Mountain.

"'You're only ten months old now,' said the old

goat grimly. 'You modern youngsters travel too fast for me. You can wait till the young birches bud.'

"In September the two travellers returned. They had seen many wonderful sights. Their great adven-

Photograph by Herford Cowling

Former inhabitants of Glacier National Park

Once it was the hunting-ground of the Blackfeet Indians. The government purchased it and threw it open for mining, but there was not enough copper to pay; so it became a national park

ture was on the road back to Lake McDermott. Rocky had insisted upon going down to examine this strange trail over which extraordinary animals sped back and forth more swiftly than the fastest deer can run.

"'What is the name of that animal?' he asked, as, from a mountain top, they watched one glide by.

"'I call it black lightning because it moves so fast. At night its eyes shine brighter than the sun. Your father thinks it is a deer, but it is more like a turtle than a deer. Some think it is a kind of horse, but it is too big for that. Twenty or thirty men can ride on one at once. The eagles tell me that these animals come from the southland. There were none here when I was young. They did not come till men made that wide trail down there. They never leave the trail; and not even the squirrels, who go very close to houses, have ever seen them eat.'

"Uncle Waggletoe was loath to go down to look at the strange trail.

"'Suppose a black lightning should come,' he said.

"But Rocky prevailed. Very reluctantly and cautiously his Uncle led the way across an intervening plain to the dusty road. They skirted it awhile before venturing to step upon it; but they found it pleasant walking and followed it for several miles. Then came their adventure.

"Rounding a rocky point with a slight precipice upon one side, Uncle Waggletoe, who was in front, suddenly spied an automobile stage approaching rapidly.

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Where Lake Ellen Wilson empties into Little St. Mary

Instantly he stopped and wagged his left hind foot at tremendous speed. He hesitated and reared. The automobile horn sounded and the passengers saw him and began to scream excitedly. For the first time in his life Uncle Waggletoe completely lost his head. His fighting instinct was aroused. He lowered his horns and gathered himself together in defense.

"Rocky's first intimation of trouble was the rapid movement of his uncle's left hind foot. He bounded forward beside him and saw the strange black animal approaching.

"As Uncle Waggletoe gathered for the attack, Rocky with a sudden instinct swung around and butted his Uncle full in the side, knocking him off the road. Down the sharp declivity they both rolled, over and over, got footing at the bottom, and galloped for the mountains at a speed which neither had ever equalled before. The automobile passed slowly by, the passengers leaning from its side to watch their course.

"In telling the story at home Uncle Waggletoe declared that the black lightning had followed them for two miles, and Rocky, who knew better because he had looked back over his shoulder, did not deny it. That much was due to Uncle Waggletoe's years and injured dignity. In fact, he made no comment even

when Uncle Waggletoe described the gnashing of the strange animal's fearful teeth and the burning sensation of its hot, panting breath.

Photograph by Fred H. Kiser

Summit of Blackfeet Mountain

"It was a jolly home-coming. Nearly two hundred goats gathered on Grinnell Mountain to welcome the wanderers and hear their strange adventures. And, when all had gone home, kindly Mother Goat gazed into her son's great soft eyes and affectionately licked his placid, kindly face.

"'You've grown so big,' she said thoughtfully. 'Your beard is longer, and you have quite a masterful air, just like your father. Tell me, boy, what was the most wonderful of all the wonderful things you saw?'

"Rocky did not hesitate a moment.

"'Flower-Bright,' he said."

"Gee!" said Jack after a little silence, "that is some story, Uncle Tom. I only wish it was true."

"Oh, quick, look, look!" exclaimed Margaret, pointing excitedly far up the mountainside. "There's a white spot that moves! See it? Oh, dear, can't you see it?"

"Yes," cried Jack, "and there's another right behind it. See? They're goats. And there is another little white spot following along behind. Do you see?"

Uncle Tom adjusted his field-glasses and examined the goats attentively.

"As I live," he said, "they are Rocky and Flower-Bright and their little kid."

VI

THE FROZEN OCTOPUS

MOUNT RAINIER THRUSTS ICY TENTACLES DOWN AMONG NATURAL GARDENS OF WILD FLOWERS

"WHAT makes that red spot there?" asked Margaret, pointing.

"Oh!" exclaimed Aunt Jane, turning in sudden excitement to a pleasant-faced man who had volunteered at the hotel to accompany the party to the Nisqually Glacier. "Tell me, Doctor McKinley, is that the red snow?"

"That's just what it is," said Doctor McKinley, smiling. "That is quite a small spot. Sometimes you may see acres of it."

"What makes the snow red?" asked puzzled Margaret.

"A tiny red plant," said Doctor McKinley.

"A plant growing in the snow?" demanded Jack unbelievingly. Doctor McKinley nodded and described to Aunt Jane in some detail the microscopic fungus which sometimes tints the névé, or coarse snow near the head of a glacier a vivid rose color.

"He's kidding Aunt Jane," Jack whispered to Mar-

garet. Then, in a louder voice: "I suppose we'll hear next that hop-toads live in crevasses."

"No," said quick-eared Doctor McKinley, "there are no hop-toads in the crevasses, Jack, but there are billions of little brown worms living in the soft snow on top of some of these glaciers."

This also was too much for Jack's credulity.

"Let's see 'em," he demanded.

"Oh, they are not so easy to find," said Doctor McKinley, smiling, "but when you do find a colony of them they are easy enough to see. They are the larvæ of some kind of small fly. But one must spend a good deal of time on the glaciers, as I do many summers, to run across these interesting things."

"I saw a bunch of them the other day," said the guide, "while I was taking a party to the summit. No," turning to Jack, "Doctor McKinley isn't kidding you."

" 'There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy,' " quoted Aunt Jane thoughtfully.

"That's from Shakespeare," said Margaret, a little proud of her knowledge. "We had that in English last spring."

This was their second day in the Mount Rainier

Photograph by Curtis and Miller

The road to Paradise Valley

National Park. They had seen the great, ghostly, snow-peaked mountain from Seattle, sixty miles away, and had declared it the most thrilling sight in their experience. They had seen it, larger and more gloriously beautiful, from Tacoma, forty miles away; and their swift automobile trip from the park railroad-station to the hotel in Paradise Valley had been accompanied by a chorus of delighted squeals from the children as the astounding white summit grew with nearness. At Paradise Valley, a rolling hillside meadowland fringed with pines and carpeted with an extraordinary profusion of wild flowers, the vast white mountain with its long, narrow glaciers, winding down from the summit on every side, loomed enormously. There was no escaping it anywhere. It drew their gaze as inevitably as a magnet draws iron. Even while Mrs. Jefferson, Aunt Jane, and Margaret were on their knees among the wild flowers, sorting them, naming them, and exclaiming over their large size and brilliant coloring, they kept looking up at the ice-covered mountain every few minutes.

"I should like to live here forever!" exclaimed Margaret fervently. "Yes, I want to sleep and picnic among these flowers all the time and keep looking up at Mount Rainier."

"It is the most wonderful contrast I can imagine," said Mrs. Jefferson. "The ice and the snow and the glaciers there, and these warm flowery meadows so close by."

"The guide tells me that there are twenty-five feet of snow right on this spot in winter," said Aunt Jane. "How should you like to sleep in the snow, Margaret?"

"You can sleep in deep snow and keep warm, too," said Uncle Billy, joining them. "Enos Mills, the Rocky Mountain naturalist, told me that he had done so many times when he was caught out overnight on the summits. But it must be soft, fresh snow to keep you warm. When snow gets packed and icy it freezes you. Deer and other animals huddle together under soft snow winter nights and keep quite warm."

Uncle Tom arrived with a government map.

"Just look at this mountain," he said. "The snowy summit and the glaciers are printed in blue. You are supposed to be looking down upon it, as if you were up in a balloon. See, it looks something like an octopus or a starfish, but with ever so many more arms than a starfish."

"What are those arms?" asked Jack.

"Those are the glaciers," said Uncle Tom. "See how they reach far down among these flowery places?

That blue finger on the map is the Nisqually Glacier which we can see right in front of us. Place your hand flat on this stone here and spread out your fingers. That way. Now, your fingers are the glaciers and the spaces between them are these parks of pines and wild flowers like Paradise Valley where we now are sitting."

"Are there many parks?" asked Aunt Jane.

"Oh, a lot of them," cried Jack with his eyes on the map. "Here is one called Indian Henry's Hunting Ground. There's one called Spray Park; I suppose there are waterfalls there. And another is called Summerland."

"Uncle Tom," asked Margaret, "what is a glacier, anyway? Of course I know it is a river of ice. But these seem so different from those wide, littler glaciers in the Glacier National Park. I don't understand."

"These glaciers, my dear," said Uncle Tom, "are very like rivers of ice, as you say. They start in enormous hollows in the rocks several thousand feet below the top of the mountain which winter always keeps full of fresh snow. These hollows correspond to the springs or lakes where rivers of water start. This snow, of course, is immensely heavy and keeps slipping down the side of the mountain, just as the water in

Photograph by Curtis and Miller

The celebrated Nisqually Glacier

From its cirque just below the summit one may follow its course to the right, then, after a sharp turn, to the left. The picture was taken in Paradise Valley

springs and lakes overflows in streams. As the snow slips down the mountainside, following depressions in the rocks, just as the streams of water follow the valleys, it becomes packed hard; then it is called névé. A little farther down the pressure of the snow above squeezes it into ice; and a little farther down, this ice is so squeezed that it becomes hard and blue.

"Like the river of water, this river of ice winds around through valleys. Do you see away up there how the Nisqually Glacier turns a corner around that huge rock? Like the river of water, it breaks into ripples when it runs down slanting places, and into cascades and waterfalls when it runs over precipices. Like the river of water, which grows bigger because other streams empty into it, the glacier grows bigger because other glaciers flow into it. Sometimes a glacier will flow for many miles, like the immense glaciers in the Mount McKinley National Park in Alaska; but sooner or later it will reach the point where ice melts, and there it will turn into a river of water. The melting-point is called the glacier's foot or snout."

"Shall we see ice waterfalls?" asked Jack excitedly.

"Yes," said Uncle Tom, "provided we climb high enough up one of these glaciers—up among the prec-

Measuring the speed of a glacier

ipices nearer the summit. But we can see rapids near here. They are not so very rapid, though, for the fastest of these glaciers only moves a foot or more a day."

"What makes the crevasses?" asked Jack. "There aren't any crevasses in rivers of water."

"Yes, there are," said Uncle Tom. "The ripples in the rapids in a stream of water correspond to the crevasses in a glacier. You know that the deep channel of a stream of water moves faster than the shallow edges, don't you?"

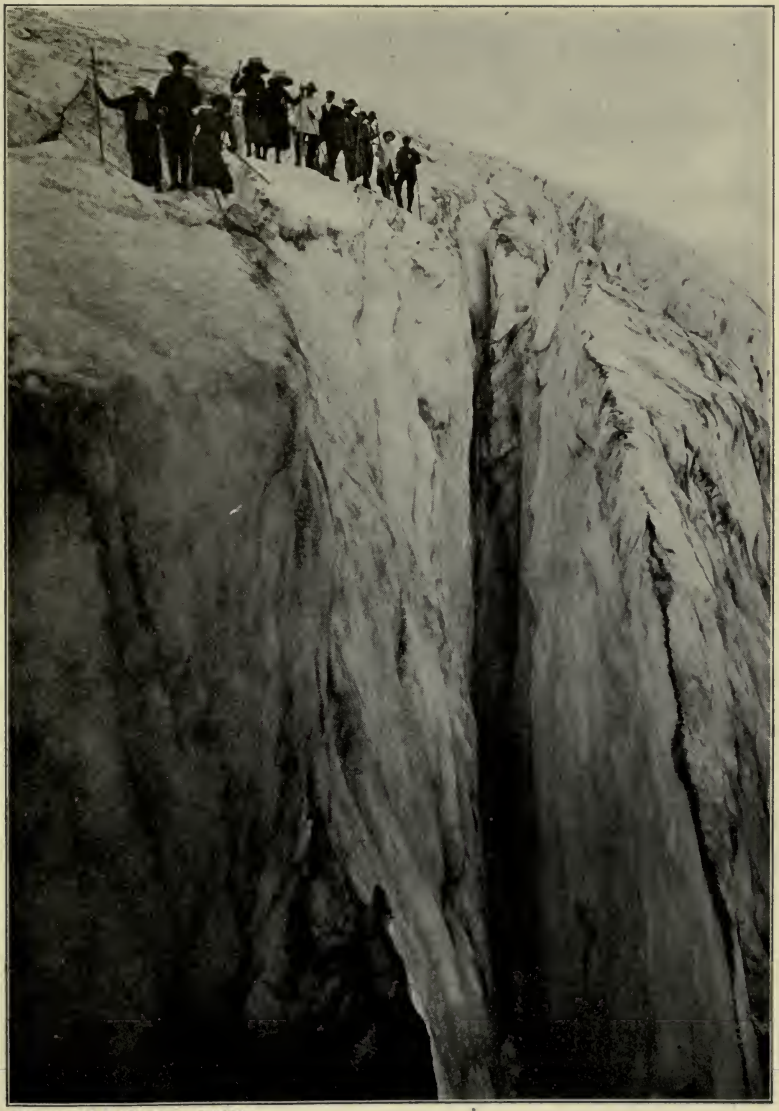
"Oh, yes," said Jack. "That is always so."

"And it is so in glaciers," said Uncle Tom. "And that difference in speed helps make the crevasses deep and gaping. The ice is pushed fast in the deep middle and held back on the shallow sides. That helps to tear open the crevasses."

Margaret was intensely interested.

"Is there any other way that a glacier is like a river?" she asked.

"In almost every way," said Uncle Tom, "because a glacier is a river—an ice-river. Now, you have seen rivers or creeks carry down logs and floating branches and heap them up on the banks where they turn corners, haven't you?"



Photograph by Curtis and Miller

Looking down into a crevasse

The ice in the Stevens Glacier is probably a thousand feet thick at this point

Margaret nodded, her eyes shining.

"And you have seen rivers and creeks wash out deep channels and ravines in some spots and heap the sand up on the banks in other spots?"

Both children assented.

"Well, glaciers do the same thing. They tear enormous masses of rock loose from some parts of their courses and heap them up in other parts. They wear out deep channels in the softer rock and pile up the material in the valleys. That is the way the prehistoric glaciers built up those immense moraines that we saw in the Rocky Mountain National Park. If the Nisqually and these other great living glaciers here should ever disappear like those in the Rocky Mountain National Park, they would leave behind them the same kind of enormous moraines."

Of course heedless Jack got into difficulties and caused a sensation. It was the day they spent on the Nisqually Glacier. The party, considerably augmented by other tourists at the hotel, started early. All were dressed warmly and wore hobnail shoes. All carried alpenstocks with sharp metal points. The guide also carried a long coiled rope.

It was hard climbing up the glacier's irregular, broken surface. Sometimes they ascended long steep

ice-hills upon which they found their alpenstocks of the greatest service. They crossed fields of coarse snow into which their feet sank deeply. Occasionally they lifted themselves by main strength over some long, uplifting ledge of blue ice. Often the guide straddled a narrow crevasse and steadied each in turn as he jumped across.

"Gee, but this is some work, all right!" Jack exclaimed more than once as he stopped for breath at the top of a sharp slope.

But the experience possessed interest for all. Their objective was a group of wide, deep crevasses a mile or more up the glacier. Incidentally Doctor McKinley pointed out and explained the most interesting glacial phenomena.

"I thought glaciers were all nice and white," grumbled Margaret, "but this one's dirty. There's most as much mud as snow, and some of the rocks aren't ice at all but really truly rocks."

"It will get cleaner as we go up," said Doctor McKinley. "Look up the course ahead of us and you will see how white the snow is there. And as you approach the summit, it becomes as pure as any snow and ice in the world. Glaciers detach great quantities of rock and earth as they plough along their courses

and carry them down to the foot, where they heap them up into big boulder fields. Those are called terminal moraines."

They made long détours to get around the ends of large crevasses, into which the children peered with awe. It was a nervous day for Mrs. Jefferson, who feared that they would slip and fall.

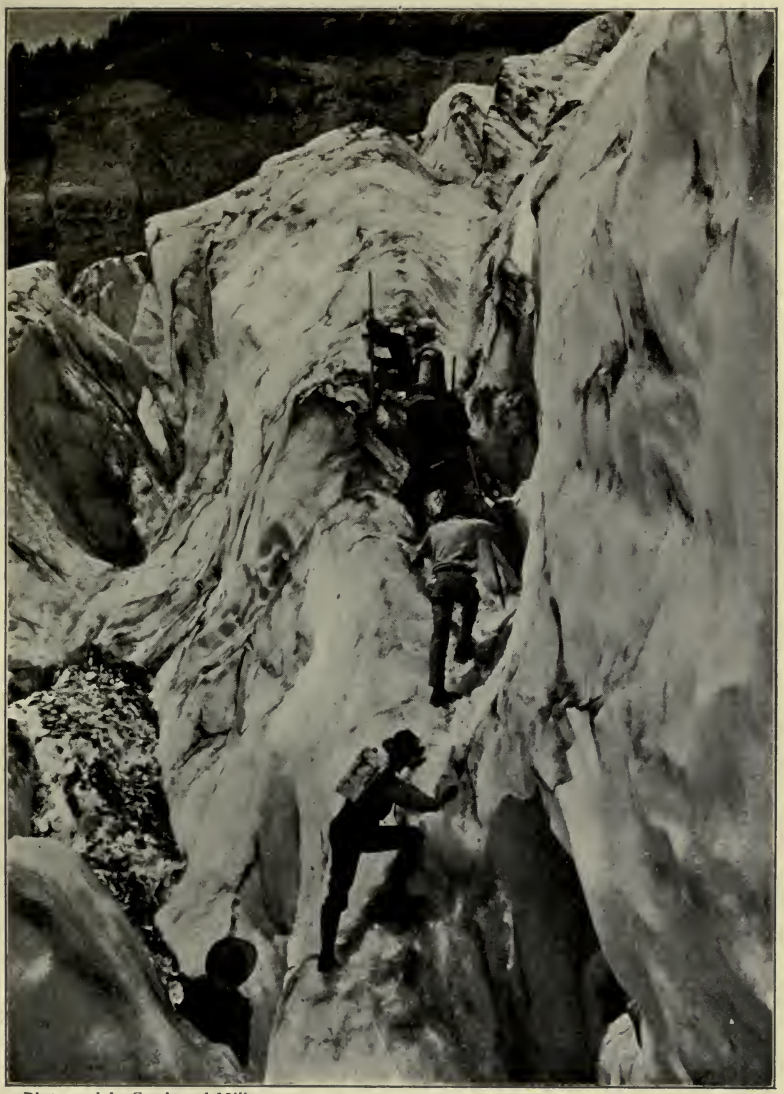
At last they came to one of the largest crevasses, and here the guide lined them up and made each hold the rope, so that, if some venturesome person slipped, the others could pull him back. He placed experienced climbers at intervals among the rest, and led the way along the edge of the crevasse till all were standing so close that they could look straight down into its depths.

They seemed to be standing on the edge of a perpendicular precipice hundreds of feet deep. In the depths the ice was blue and cold, and passages seemed to lead to chambers still deeper.

"Some refrigerator!" said Jack admiringly. "Dad wouldn't need to kick about his ice-bills if he lived here."

"I want to go down inside there," said Margaret.

Margaret's wish was fulfilled, but not at that point. An hour later the guide led them by a long, circuitous



Photograph by Curtis and Miller

Exploring Nisqually's crevasses

route into ice-caves which extended far under the overhanging ledges of icy surface. It was so still that Margaret shivered and clung tightly to her mother's hand.

"It isn't so nice here as you thought it would be, is it, Margaret?" asked Mrs. Jefferson.

"Oh, yes, it is," protested Margaret. "It's just splendid, and the ice walls and roof are the loveliest things I ever saw, but—but——"

And she clung the tighter.

"Come back here, Jack!" called Uncle Billy suddenly, for Jack had crept ahead of the party and was peering over an edge beyond. The sharp call echoed surprisingly loud and hollow in the cave, and Jack turned a startled face. At the same time he slipped and disappeared.

Then there was excitement indeed. Several ladies screamed and others of the party exclaimed loudly. The cave magnified the noise and that further increased the excitement. The guide sprang forward and waved the others back.

"Stay where you are!" he commanded. "Doctor McKinley, you come! The rest of you stay back and hold this rope!"

He threw them an end of the rope, the other end being fastened to his belt, and wriggled forward on his

At the same time he slipped and disappeared.—Page 130

stomach till he leaned far over the edge. Doctor McKinley braced himself firmly and held the guide's legs.

"Jack!" called the guide. "Jack!"

When no response came from below, some of the ladies began to cry. But Mrs. Jefferson, white-faced,

was not one of them. She held the rope firmly in one hand and with the other comforted Margaret.

Then, with Doctor McKinley paying out the rope and the party holding its other end, the guide dropped over the edge into the dark gulf below. The rope slackened when there were only a few feet of it left in hand. At last he had reached bottom. There were twenty minutes of silence which seemed many hours to Mrs. Jefferson. Poor Margaret was crying hysterically.

Then from the depths came a cheerful shout:

"A-l-l right! Pull slowly."

And in due time the guide appeared over the edge, steadying himself with the rope in his left hand and holding, with his right arm, a very badly frightened boy, who clung around his neck.

"He was caught on a ledge just a little way down," said the guide. "He ain't hurt much, I don't think, but he was too scared to speak and it took some time to find where he was. Then I heard him kind o' catch his breath and that located him. Then I climbed up to his ledge and got him. Nobody but boys ever gets hurt on these glaciers. There ought to be a law to keep 'em home."

It is not surprising after this experience that Mrs.

Jefferson refused to let Jack join the party to the summit a couple of days later. Indeed, though Jack had learned his lesson well, she did not permit him to leave her side again.

Photograph by A. H. Barnes

On the Cowlitz Glacier

After a long debate, Aunt Jane concluded to join Uncle Tom and Uncle Billy in the ascent of the Great Mountain with the party which had been forming at the hotel for several days. Her weeks of horseback and walking had put her into excellent physical con-

dition. Two other women, experienced climbers, who were going with the party, thought she might venture after hearing of her successful ascent of Longs Peak.

As they started at midnight, in order to be able to return by the following nightfall, the children did not see the party off. After breakfast Mrs. Jefferson took them by automobile to see the beautiful Narada Falls, where, at lunch, they were joined by Doctor McKinley afoot.

"I thought you went with the summit party," said Mrs. Jefferson.

"No," he said. "Four ascents are enough for one man. The last time I thought I knew the trail well enough to guide our little party myself, but we had a snow-storm coming down and I lost my way and did not get my people in till after midnight. We were all of us exhausted, and my brother frosted his foot so badly that he did not get over it all summer. I've had enough. It is one of the hardest climbs in the country."

"I am worried about my sister," said Mrs. Jefferson.

"You need not worry," said Doctor McKinley. "Great is youth. She is young enough to make little of it. And it is so supremely worth while. On one of

my trips to the north side I saw an enormous avalanche plunging four thousand feet from the top of Willis Wall. It was a spectacle."

"Doctor McKinley," said Margaret, "a girl at the hotel says that Mount Rainier is a volcano. Now, isn't that silly! I told her that volcanoes smoked and that the hot lava would melt all the ice. Wouldn't it?"

"But the little girl was right," said Doctor McKinley. "Mount Rainier is a volcano, but it has not been in eruption for many, many years. But the first white settlers of the neighboring country reported a fall of ashes from its crater, and even now hot gases emerge from cracks in its rocks. These hot gases melt snow in places and form caves which have proved to be very useful refuges for people who were caught overnight at the summit. Mount Rainier is the biggest of a range of volcanoes which are called the Cascade Mountains. They extend from Canada in a long line through the States of Washington and Oregon and into California. Other peaks besides Mount Rainier are quite famous. Farthest to the north is Mount Baker, in Washington. Then comes Mount Rainier, Mount Adams, Mount Saint Helen, Mount Hood in Oregon, and Mount Shasta in California.

You may have heard all these famous volcanoes talked about. If not, you will some time.

"Now, all these great mountains began by being holes in the ground out of which lava spurted. The lava and the ashes built the volcanoes. They must have been a fine spectacle from the sea if they were all active at once. John Muir once called them a line of blazing beacons. Then they became inactive. They may have become choked with ashes. Anyway they grew cold, and the winter snows turned them into ice-plated monsters like Mount Rainier."

"But I thought that volcanoes all had sharp summits like Mount Vesuvius and that Japanese volcano with the funny name," said Margaret.

"You mean Fujiyama," said Mrs. Jefferson.

"Probably they all were pointed at some period of their careers," said Doctor McKinley. "But strange accidents happen to volcanoes sometimes. Crater Lake, where you are going after you leave here, fills a hole in the ground. But above that hole was once a giant volcano nearly as high as Mount Rainier. One day the bottom fell out of it and the entire volcano tumbled in and disappeared somewhere inside the earth.

"Mount Rainier's was a different kind of an acci-

Photograph by Curtis and Miller

Mount Rainier reflected in Mirror Lake

dent. It was pointed once, like Fujiyama, but one day two thousand feet of it were blown off by a fierce eruption. That is why its summit is blunted now."

"Oh!" cried Margaret, clapping her hands. "That must have been a fine sight. Did anybody photograph it?"

"No, indeed," he explained. "That and everything else I've been telling you happened long before Adam and Eve lived in the Garden of Eden. There were neither cameras nor photographers in those days."

"Well, how do you know it ever happened then?" Margaret demanded, big-eyed.

"You'll find that out and hundreds of other happenings just as thrilling when you study geology," said Doctor McKinley.

At dusk that night both children ran into the hotel in a state of great excitement.

"Oh, Mother!" cried Jack. "Three awful big old circus clowns just came for us outside there. At least one of them was little. She's a woman, and——"

"What do you mean?" demanded Mrs. Jefferson. "They came for you——"

"Yes, just ran right at us," began Jack. "They grabbed at us just like that." And Jack seized his mother's arm roughly.

"And one of them tried to kiss me!" wailed Margaret. "Oh, they're the awfullest things! I——"

But Mrs. Jefferson with flushed face was hurrying to the door.

Just without, consumed with laughter, were three persons with chalk-colored faces, large yellow spectacles, and red bandanna handkerchiefs around their necks.

Mrs. Jefferson started, looked fixedly at them, and exclaimed:

"Why, you children, you! What in the world are you doing rigged up like that? Margaret! Jack! See, they are not real clowns. They are only Aunt Jane and your two uncles playing a joke on us. Don't you recognize them now?"

And so it was. According to custom, they had painted their faces before starting for the snowy summit that morning, in order to protect their skins from painful sunburn.

VII

WHAT HAPPENED TO MOUNT MAZAMA

WHERE IT ONCE STOOD NOW LIES CRATER LAKE, THE DEEPEST AND PERHAPS THE BLUEST LAKE IN THE WORLD

ONCE upon a time—and a long, long time ago it was, many thousands of years before the serpent tempted Eve in the Garden of Eden—a baby volcano was born on the shores of the Pacific Ocean. Smoke had long been struggling up from the intense heat far under the surface, and had found vent here and there through cracks in the rock and the softer earth. There had been an uplifting of the surface nearly to the present elevation of the Cascade Mountains, and hot gases had expanded and pressed upward, until at last a hole was torn in the earth's skin; and through this hole the struggling gases and the molten rock called lava burst forth.

That is how the baby volcano was born.

It was probably a pretty big baby right from the beginning. The hot dry ash thrown high in air upon the first explosion fell back around the hole, heaping up a cone-shaped mound. Up through the apex of

this cone rose the boiling, seething lava. The lava poured down the sides and hardened, building the cone higher. Then followed other explosions from below and more ash fell upon the lava, building the cone still higher. Then came more lava, then more ash, and so on until after that very first series of eruptions the baby volcano was perhaps several hundred feet high.

A big fat baby, indeed.

Thus it grew. No one now can make even a fair guess how fast it grew. There may have been long periods when there were no eruptions and it did not grow at all. There were probably periods of many years during which eruptions succeeded each other almost continuously, and then its growth must have been extremely fast.

Meantime, all along the Pacific coast, where now are the great States of Washington and Oregon, other baby volcanoes had been born on the crest of the uplift and were growing just as fast. There must have been an enormous family of them, because in the course of a great many hundreds, perhaps thousands, of years they grew so big that their sides overlapped and the hot ashes which the wind caught and blew for many miles in all directions filled up the valleys between

them. When that time came, instead of perhaps hundreds of detached volcanoes, a great mountainous range thousands of feet high paralleled the Pacific coast. Men call this to-day the Cascade Mountains.

But all of these many volcanoes did not continue to live. Most of the babies died in childhood and were buried under the growing slopes of their bigger brothers and the immense masses of ash which the wind deposited in the hollows.

As the smaller volcanoes choked up and disappeared below the growing surface, the lava which had been finding vent through them sought other doors of escape, and found them in the volcanoes of larger vent. This, of course, made the larger volcanoes grow all the faster.

It was an example of the survival of the fittest, which is one of the first laws of nature. Those children who study the hardest become more and more able to study, and inevitably near the top of the class—another example of the survival of the fittest.

The baby volcano which is the hero of our story was one of the fittest of its own great family; it became one of the survivors. It grew enormously, climbing always above the range as the range itself climbed higher. It was an ambitious volcano. When the grow-

Photograph by Herford Cowling

The Lake of Mystery

ing mountain range had swallowed most of the others and perhaps was approaching its own greatest size, this was among the very biggest of the fifteen or twenty peaks which continued to spout fire and float dense volumes of smoke hundreds of miles to sea upon the east wind.

How many centuries these monsters lit the Pacific nights with their lurid torches no man can guess. One of them, now called Mount Rainier, lost two thousand feet of its summit in one mighty explosion; but it still remained fourteen thousand feet high. Most of the others suffered similar accidents, but still remained majestic mountains, and remain so to this day. Only one of them was totally destroyed, and that one is the hero of this amazing history. Though no man ever saw this great peak, which once may have towered even above Mount Rainier, it bears a name. But Mount Mazama was not named until centuries after it had ceased to exist.

Other volcanoes have died the remarkable death of Mount Mazama, but none other possibly of equal size. Its extraordinary passing would have been a spectacle, had men lived then to see it, unequalled perhaps in all the earth's remarkable and dramatic history.

Mount Mazama, possibly at the zenith of its great

career, slipped down through the crust of the earth and totally disappeared. It was as if the foundations that held it up had suddenly given way. Its enormous mass, thrown up from below, returned into the pit from which it had come. Perhaps Dante might have described the awful spectacle.

How do we know that this thing happened so long before human history? Those patient students of the history and the romance of the rocks, the geologists, have found proofs which none may doubt. It is enough here to say that what is left of Mount Mazama's sloping sides indicates that it must have been a volcano sixteen thousand feet in altitude, and that a profound study of the inside of the rim through which it slipped proves that actually it did slip. That it was not blown out is proved by the fact that the lava sides which remain are composed only of material which flowed down from a lofty summit during regular eruptions.

But this is not all the strange history of this volcano. The seething fires underneath the earth's surface attempted once more to burst forth through Mount Mazama's vent. But now the vent was choked. Again and again the fiery gases burst through the ruins of what was once so majestic a peak, only to be smoth-

ered by the masses of loosened ash. Three times were small craters actually formed. Then the fires were choked forever.

But that is not all. Where Mount Mazama stood in awful fiery grandeur there appeared a lake of beauty so profound that to-day it is celebrated throughout the world. It suggests a fairy-story—this transforming touch that changed awfulness into loveliness. Spring-water seeped through the lava foundations of the tremendous pit that once was the towering mountain and filled it with water of wondrous blue. But it did not fill it full; it left walls a thousand feet high, lava walls of faint blue-grays, streaked and daubed with splendid colors which reflect in the lake's deep waters.

The tomb of the monster Mazama is one of the wonder spots of sheer beauty in the wide world.

"Doctor McKinley," said Margaret after a few moments of silence, during which Mrs. Jefferson gazed thoughtfully into the gorgeous depths of Crater Lake, "that is more exciting than any fairy-story I ever heard. But what a dreadful shame that Mount Mazama died when all his brothers and sisters lived! I 'spect they must of cried a lot."

"Mount Rainier is crying rivers of icy tears yet,

Margaret," said Aunt Jane. "Oh, but what an amazing history! Yes, it somehow changes one's whole conception of Crater Lake. It has become a new place for me. I suppose it must be very deep."

Photograph by Herford Cowling

A pound trout is a small one

"Two thousand feet," said Doctor McKinley. "It is supposed to be the deepest as well as the bluest lake in the world."

"Where are your uncles?" asked Mrs. Jefferson.

'Fishing," said Jack. "The mean things wouldn't

take me. They said I'd rock the boat. Say, Mother, the trout here are awful big. A man said they were the hardest fighting trout anywhere."

"They are good fighters, Jack," said Doctor McKinley. "The water is very cold, you know. Yes, they're big. The little ones run a pound. I won't take you fishing, Jack, but I'll take the whole party out in the launch. No one has seen Crater Lake who has not skirted its shores in a boat."

Mrs. Jefferson, after an automobile ride to different points on the ruin, had agreed that the deep blue, which she had considered a gross exaggeration in the pictures and lantern-slides she had seen at home, did not begin to express the wonder of the lake's actual color.

"Under different slants of light, it is every shade of blue there is," she said. "Right down there now, it is deeper than any indigo or Prussian blue I ever have seen. It is really almost black. And compare that with the vivid greenish blue of the edges."

"But the wonderful water," said Aunt Jane, "seems to me scarcely as wonderful as these mauve cliffs. It is hard to say just what color they really are. Sometimes they are gray, sometimes blue, sometimes purple, sometimes yellow, but mostly, I think, mauve.

Photograph by Fred H. Kiser

The water is bluer than the darkest indigo

They change their color from hour to hour. A cloud floats across the sun and instantly we have a new color scheme. When that thunder-storm threatened yesterday, the whole lake acquired a foreboding, almost terrible, aspect; and yet at sunset it became a sort of painter's palette, a riot of glorified color—every soft and gentle tint you can conceive, set off against the heavy but translucent shadows under the western cliffs."

"Yes," put in Mrs. Jefferson eagerly, "and before sunrise it is again altogether different. I looked at it from my window this morning. The walls were gray then, and you could plainly see those great splashes of sulphur yellow across the lake. The water then was the color of polished steel. The surface appeared hard, as if frozen. It looked as if a rock thrown upon it would bounce up and skim across the surface of the lake."

"Yes," mused Doctor McKinley, "I have travelled the world and have seen nothing just like this. There are other crater lakes, one in Mexico, several in Austria and elsewhere, but nothing that compares with this. It has something of the color glory of Capri; something of the mystery of the Grand Canyon; something of the fairylike impossibility of afternoon

"Just look for a moment over there at the Phantom Ship," interrupted Mrs. Jefferson

in the Yosemite Valley. It has all these—and something else. It is alone."

"Just look for a moment over there at the Phantom Ship," interrupted Mrs. Jefferson. "The water is so pale you scarcely can call it blue."

"Where is the Phantom Ship?" asked Margaret.

"Right over there," said her mother, pointing.

"I don't see it," said Margaret.

"Why—why"— hesitated Mrs. Jefferson—"it was there. Exactly there by that cliff. I can't seem to see it now. That is very strange. Why, I would have made my affidavit——"

"Mother's dreaming," said Jack. "The color has gone to her head."

"It wouldn't seem strange to me if it did go to her head," said Aunt Jane. "I actually feel unreal myself. I'm not sure, somehow, that I'm here at all."

"We're all dippy," said Jack. "To tell you the truth I thought I saw the Phantom Ship, too. But she isn't there and that's a fact."

"Doctor McKinley," said Mrs. Jefferson with heightened color, "will you point out the Phantom Ship? I was so sure I saw it in that spot. Now I feel all turned around."

Doctor McKinley was laughing.

Photograph by Herford Cowling

The Phantom Ship

"Certainly, I can," he said. "It is exactly there, under that headland, just where you said it was."

"But I can't see it," persisted Mrs. Jefferson.

By this time all were looking intently at the spot, but no one saw it. Doctor McKinley was laughing silently.

"I don't believe you see it yourself," said Jack defiantly.

"I don't," said Doctor McKinley calmly.

They all turned to him.

"He's dippy, too," Jack whispered to Margaret.

"That's why it is called the Phantom Ship," said Doctor McKinley, smiling. "In some conditions of atmosphere, particularly on a warm day like this, that curiously shaped rock will disappear and reappear in the most mysterious way. Other objects on the water may do the same thing. It's a kind of mirage."

"There it is!" shouted Jack.

And there it was again, exactly where Mrs. Jefferson had first seen it.

Even the children were silent during the afternoon hours in the boat. The reflections of the marvellously carved and painted lavas in the still, deep waters absorbed them. But even these were not so fascinating as the ripples made by the boat's prow; every painted

wavelet was tipped momentarily with a blue so gorgeous that, as Aunt Jane said, no paint could reproduce its value.

The afternoon closed with a sunset view from the cliffs. They had trout for dinner.

Watching the lake by moonlight, Doctor McKinley told them the Indian legends.

Crater Lake was once the kingdom of the great god Llao. Here he ruled a multitude of strange, ferocious creatures which resembled crawfish. They were of enormous size. It was nothing for one of them to lift a claw from the lake's surface and pluck a deer from the top of the highest cliff. Several of these cliffs are two thousand feet high.

Llao had an enemy, the brave Spirit Chieftain Skell, whose kingdom was the Klamath Marshes, twenty miles away. He also had an army of servants, not so huge and ferocious as Llao's, but possessed of the power to change themselves at will into other forms. Sometimes Skell's servants bounded over the cliffs of Crater Lake in the form of antelopes. Sometimes, as eagles, they soared aloft above its surface. Many were the bitter wars waged between Llao and Skell.

In one of these wars Skell was too venturesome. Llao's monsters captured him and dragged him be-

neath the blue waters. It was decided to wreak a terrible vengeance upon him. So they tore out his heart, still living.

Then the monsters climbed the many mountains in the outlying region, each monster upon a separate peak. They played ball with Skell's living heart, tossing it from mountain-peak to mountain-peak, from monster to monster.

But Skell's followers came to the rescue. As eagles they circled around the peaks, and one of them caught Skell's heart in flight. The monsters pursued, but the eagle, hard pressed, dropped Skell's heart to another warrior, who, in the form of an antelope, was following on the land below. The antelope slipped through the woods and into dark ravines, and escaped with it.

Skell's heart still lived, and back in the Klamath Marshes his body grew again around it.

Years passed and Skell, recovered and with plans matured, again made war. It was a long and bloody war, and in the end Llao was captured. The monsters retired to the deep waters.

Skell took Llao to the top of the highest cliff overlooking Crater Lake, and tore him into small pieces.

He threw the fragments, one by one, into the lake, and the monsters, not recognizing them as fragments

Photograph by Fred H. Kiser

The painted lava rim and Phantom Ship

of their great chief's body, seized and ate them as they fell. Finally, he threw Llao's head into the lake. The monsters recognized that and did not touch it.

Llao's head lies in Crater Lake to-day. It is partly exposed, and men call it Wizard Island.

"What?" exclaimed Jack, "Wizard Island? That little volcanic crater that sticks out of the water, the one we rowed to and climbed the other day?"

"That," said Doctor McKinley solemnly, "is Llao's head. And Llao Rock, where you went with your Uncle Tom, is the cliff from which Skell threw it into the lake."

"Gee!" said Jack.

"For many years," continued Doctor McKinley, "the Indians would not come near the lake. They feared Llao's monsters. Some would venture occasionally to the rim and look down for a few moments, but only the great braves did that.

"Once a band of Klamath Indians came unexpectedly upon it, and ran away in terror. But one, charmed by its beauty, dared to stay awhile, and no evil befell him. So a few days later he returned, but saw no monsters. He repeated his visits. He even lighted a camp-fire and slept there. Nothing happened.

"He wanted to see these waters close by, to peer

into them, and perhaps catch a glimpse of one of the monsters. So one day he crept down a forest-covered slope and lay a long time at the water's edge under cover. Then he ventured to bathe in the waters, and suddenly felt wonderfully strong. He went back to his tribe and performed marvellous feats of strength. It seemed certain that these waters possessed great virtue. Another Indian ventured, bathed, and also received supernatural strength. So in time the whole tribe bathed there. They became the most powerful tribe in the world. That is how the Indians lost their fear of Crater Lake."

"Margaret," said Jack the next morning, "I like Doctor McKinley mighty well. But I wonder why he came down here with us. You remember he was going east the day after we met him at Mount Rainier. He said he had an important engagement in Chicago that he could not possibly break. But he stayed with us there just the same, and now he's down here, too."

"Don't you know why?" Margaret looked very wise. Jack shook his head.

"Boys don't know anything," said Margaret. "I never saw such stupid things."

"But why?" demanded Jack. "If you know, stop your kidding and tell me."

"I'm not kidding," said Margaret. "Any girl would know without being told. It's Aunt Jane, of course."

"Aunt Jane?" asked Jack. "What do you mean? What's Aunt Jane got to do with it?"

"Ho! ho! ho!" laughed Margaret scornfully. "He doesn't know even when he's told! Boys are the stupidest!"

Jack looked at her some time in silence. Then his eyes opened very wide.

"Do you mean," he gasped, "that he's spoons on—Oh, ginger pop!"

"Why, of course. I knew it the second day he was with us. Can't you see that that's what makes Uncle Billy so different lately? He doesn't say a word any more, and he laughs hollow."

Jack looked dazed. Uncle Billy, too? Margaret laughed tauntingly.

"Do—you—mean—" began Jack, and stopped with open mouth.

"Why, of course I mean," said Margaret. "Any girl would know it. I've known it for ages and ages."

VIII

THE INCOMPARABLE VALLEY

BUT THERE IS MUCH MORE THAN THE VALLEY IN THE YOSEMITE NATIONAL PARK

IN their tour of the national parks, the Jeffersons had found no repetitions. Each park had impressed them with its own personality. Each had proved so different from every other that, except for their common possession of mountains, forests, streams, and valleys, no one of them suggested any other. The Yosemite National Park was no exception; in fact, it emphasized the rule.

"One of the Government booklets stated that the Yosemite Valley was incomparable, but I didn't quite believe it," mused Aunt Jane. "Now I know it must be true. Surely there can be nothing in all the world like this, or comparable with it. These sensational granite cliffs would be enough, this exquisite valley would be enough, these amazing waterfalls would be enough. To have them all together in one spot seems almost too much. Somehow I feel suppressed and humble."

But there was nothing suppressed or humble about Jack. The Yosemite Valley did not affect him that way. In fact he had uttered an unrestrained whoop upon approaching the Gates of the Valley; he had shouted at his first sight of El Capitan, and had led the chorus of exclamations over Bridal Veil Fall. As their automobile stage had farther penetrated the valley, his shouts had become louder and more frequent.

"If you will only stop your noise just for a minute now and then," said Margaret, "some of the rest of us would have a chance. Why, I haven't heard myself yell yet. It isn't fair."

But Jack did not even hear her. He had just caught sight of Half Dome.

"Gee!" he shouted, "look at the old monk. Gee! See the size of him. Say, Mother, do you see the old monk? Say Uncle Billy, is that just a rock? Oh, what a whopper! Say, Uncle Tom, can you climb up there? Say, Margaret——"

Jack did not wait for answers to his questions. He was too excited. And the others were far too absorbed themselves to understand or to answer.

But when, an hour later, they stood at the foot of the Yosemite Falls and gazed up a clear half mile of

Half Dome rises 5,000 feet above the Yosemite Valley

falling water, Jack really was startled into two or three minutes of silence. When he did break forth again he beat his own best record.

"You've found your master at last, Jack," said Uncle Billy during the interval, "but it took the highest waterfalls in the world to talk you down."

"How high are they?" asked Mrs. Jefferson at last.

"The lower fall," said Uncle Tom, "which looks so tiny by comparison with the upper fall, is twice as high as Niagara Falls. The upper fall, which is by far the loftiest in the world, is nine times as high as Niagara. From the crest of the upper fall to the pool at the foot of the lower fall just lacks half a mile."

"It seems to fall so slowly," said Aunt Jane. "How leisurely the water floats down. All the waterfalls I've ever seen fairly rushed down. As a matter of fact, the lower fall moves faster than the upper fall. Why is that? The same natural laws govern both."

"That," said Uncle Tom after a few minutes' thoughtful study, "looks true, but isn't. The water seems to fall more slowly in the bigger fall because we do not realize how high the big fall is. The movement appears slow because the water has so very far to travel. As a matter of fact, the water near the bottom of the larger fall may be dropping faster than that of the

lower fall. It is farther from us, too, which helps the illusion."

The Jeffersons, whether living in hotel or public camp, always had been most comfortably cared for, but they were hardly prepared for the luxurious living they found possible in the Yosemite. The big hotel supplied every reasonable need. One of the several large public camps was equipped with small log houses instead of tents, each lighted with electricity, and heated with a small wood-stove. Two of the camps had swimming-baths. And miles away in the wilderness were chalet camps equipped with grills and shower-baths for the comfort of travellers by trail.

But the children wanted to camp out—"really, truly camp out, Mother, and do our own cooking."

"Why not?" asked Uncle Billy.

So the supervisor assigned them a camp ground in the upper part of the valley alongside the rippling Merced River, and a camping outfit complete, even to cooking utensils, crockery, and linen, was rented in the village and speedily set up.

"It's just like a fairy-story," said Margaret. "The fairy godmother waves her wand, and here we are with everything we want. Uncle Billy makes a splendid fairy godmother."

And what fun they had! Mrs. Jefferson was cook, Aunt Jane housemaid, Jack fireman and woodchopper, Margaret waitress, and all hands dish-washers. For two or three mornings Mrs. Jefferson went to market and ordered provisions to be delivered by wagon at the tent-door. Then a neighbor pointed out a telephone fastened to a near-by tree, and, much to the children's mystification, there was no more going to market.

In the morning, Margaret would say she wanted steak for lunch, and in a little while a boy would walk in with the steak.

"It's like the Arabian Nights," Margaret would say. "You are the fairy, Mother, not Uncle Billy."

Jack teased to know how Mrs. Jefferson brought about this magic. How did the shops in the village know what she wanted?

"I just wave my hands to old Half Dome up there, and whisper what I want," said Mrs. Jefferson, "and, presto, it is here."

"How lovely!" cried Margaret, clapping her hands.

"Mother's just fooling us," said Jack, "and I'm going to find out how she does it."

"Please don't, Jack," pleaded Margaret. "I don't want to know. I'd rather think it is old Half Dome sends us the things we want."

Mrs. Jefferson managed to keep up the mystery for nearly a week. It was sometimes difficult to evade Jack's vigilance long enough to disappear into the little clump of trees and telephone her orders. But she did it, and Margaret continued to live in fairy-land. Jack, however, was not to be foiled; when he failed to solve the mystery in camp, he walked all the way to the village and asked the butcher. Then he diligently searched the woods till he found the hidden telephone.

Mrs. Jefferson managed to keep up the mystery for nearly a week

But Margaret cried for a few minutes when he announced his triumph at the dinner-table; she refused to forgive him for a whole hour.

"Jack is the meanest thing in California," said Margaret.

"Never mind, Margaret," said Mother. "I am very well satisfied with you both. It is too bad that fairy-land was destroyed, but—well, I feel surer now than ever that Jack will get along in the world."

For a while the party idled in the dreamy, exquisite valley. They fished a little in the Merced but caught no trout. They explored the valley afoot, in automobiles, and on horseback. They spent a never-to-be-forgotten morning at the base of majestic El Capitan. They photographed the Three Brothers and Cathedral Spires. They studied Yosemite Falls from every point of view, spending one day in a climb to the top, where they ate luncheon while peering over its crest into the wonderful valley so far below. They picnicked on the Happy Isles, and lost their hearts to Vernal Fall. They gloried in the color changes as the sun shifted the shadows with the passing hours. They marvelled at the tricks that sunset played with Half Dome.

Occasionally they had afternoon swims in one of the pools. One evening Uncle Billy took Mrs. Jefferson and Aunt Jane to a dance at the hotel while Uncle Tom stayed in camp with the children. They found the pleasantest of neighbors among the campers, many

of whom brought their cars with them and camped all summer, returning year after year. At the hotel and on the trails occasionally they met friends from the East. They made up parties for more distant trail

Cathedral Spires (centre) and Cathedral Rocks (right)

rides, spending a night or two in the far-away chalet camps.

Jack had never cared as much for fishing as most boys, but one of these excursions made him an ardent angler. The excursion was to Lake Merced, fifteen

miles up the river by trail. They had not intended making the trip. It grew out of an excursion to Glacier Point, which rises thirty-three hundred feet almost perpendicularly from the valley floor. They took the long trail past beautiful Vernal Fall and majestic Nevada Fall. They lunched at the top of Nevada Fall while their horses cropped stray clumps of grass near by.

As they approached Glacier Point a view disclosed itself so different from any they had yet seen that they were overcome with surprise. The Yosemite Valley itself was hidden, but, from this great height they looked up the entire length of two noble canyons, at the near-by junction of which Half Dome lifted its majestic, hooded head. Both valleys were disclosed to the distant range of sun-topped mountains, called the High Sierra, in which originated these clear, trout-haunted rivers.

"I scarcely believe," said Uncle Tom, "that the world contains a view of nobler beauty than this."

Commanding this view at the highest point stood an excellent hotel where they registered for the night, and then climbed over the rocks to Glacier Point to look down from behind the iron railing into the Yosemite Valley. It was a day of sensations and emotions.

Vernal Fall

Nothing but Margaret's timely screams and Uncle Tom's quick restraining hand prevented Jack from climbing out on the rock which overhangs the Yosemite Valley.

"People do go out there," said Jack, protesting. "There's lots of photographs down in the village showing people standing there. I saw one with two girls sitting on the edge dangling their feet over the valley."

"Nevertheless, you are not going on the Overhanging Rock, or anywhere near it," said Uncle Tom sternly. "You understand, do you?"

Jack was a little awed. Uncle Tom never before had spoken just that way.

"Yes," he said meekly.

"One step toward it," said Uncle Tom, "and you go into the hotel and stay there for the rest of the day. You understand me."

Jack remembered the ice-cave at Mount Rainier. He needed no more warnings.

They dined on the porch of the hotel overlooking the High Sierra and watched the sunset. Just before the sun sank behind them, the effect was magical. The shadows rapidly deepened in the valleys, shutting out even the Vernal and Nevada Falls, until only the

highest peaks, the gigantic head of Half Dome, and the snow-capped monsters on the horizon glowed in brilliant rose tints. Then, almost like the dropping of a curtain, the whole spectacle darkened.

Liberty Cap and Nevada Fall

They sat in silence for a while, and then slowly arose and turned away.

"Oh, look—look!" cried Margaret. "Something's happened! Oh! oh!"

They turned back quickly and looked again. Some-

thing indeed had happened. For again the whole scene glowed. A rich, mellow, golden light, shot through with indefinable rose tints, pervaded, rather than lighted, the magical setting. It was like nothing any of them had seen before. It was mystical, unreal, almost ghostly. The strange light increased rapidly. All held their breath. Even Jack was still and silent.

"Wonderful!" exclaimed Aunt Jane fervently. "But what is it?"

"The afterglow," explained a voice behind her.

"And look at Half Dome," whispered Mrs. Jefferson. "Jack is right about him. He is a monk. From here, in this light, those rock shoulders are like arms outstretched. His head is bowed. He is pronouncing the day's benediction upon the sleeping valley."

The spirit of adventure possessed the party the next morning, and, unequipped as they were for more than one night's outing, nevertheless they determined to push on up the canyon to Merced Lake. They passed through a region of glacier-polished granite lying in long, sharp slopes from the mountain ridges down into the noble canyon through which frothed the Merced. The trail led far enough up the mountainsides to clear the dangerously smooth granite.

In mid-afternoon they reached a lake lying among

mountain tops. Hidden in a pine forest at its head was a large and comfortable camp where well-furnished tents were assigned them.

"I'm going fishing," said Uncle Billy as soon as they were well settled.

"And I," said Uncle Tom.

"And I," said Jack.

"And I," said Margaret.

"And I," said Aunt Jane.

"And I, too," said Mrs. Jefferson, "though I've not been fishing since, as a little girl, I caught minnows in the brook in Father's south woods."

They hired rods and flies and rowed out upon the lake in boats. Here Margaret caught her first trout. In fact, they all caught a few trout.

"They're not very big," said Jack; "not much bigger than Adirondack trout."

"You want to ketch a big one, eh?" laughed the boatman. "Well, I know a hole in the river. Get your dinner very early and come on out. I'll give you a chance."

Dinner in a big tent was hot, varied, plentiful, and well served. The boatman awaited them outside. He led Jack and his two uncles to a long bend in the river, shallow on one side, swift and deep on the

other. He tied the boat to overhanging willows and let it drift with the current. They settled themselves comfortably in it and cast in turn, allowing their flies to float down over the swift depths.

Uncle Tom caught the first fish, a fine rainbow-trout twelve inches long. It fought gamely in the fast water. Then Uncle Billy took one somewhat larger. Jack lost two in succession, one of which ran rapidly down-stream, bending his rod and pulling free.

"That was some fish," said the boatman. "It's your own fault you lost him. You'd ought to have give him line. Next time you get a fish like that, don't pull; let him have all the line he wants. Let him tire himself out. He'll ketch himself if you'll only let him."

Jack almost cried with vexation, but presently forgot it in Uncle Tom's hard fight with a trout which measured sixteen inches when, at last, it lay in the bottom of the boat.

"Oh, I see how," Jack said after they all had sufficiently admired the beautiful prize. "I watched how you did that, Uncle Tom. One time you let him have so much line I thought you'd never get him back again."

Several smaller fish were landed; then the trout

ceased to rise. Jack had had several rises, but had hooked none.

"Just my luck!" he complained. "The only time I hook a big fish I lose him."

"It's all over," said Uncle Billy. "They've stopped rising. Anyway, it's time we stopped. The sun's down, and it is getting late. We've had good sport while it lasted."

Jack continued casting after his uncles had taken apart their rods and were impatiently urging him to come.

"Just once more, and then I'll come sure," said Jack. "I promise."

Then it happened His long line had

Many years ago the Yosemite Valley was the safe retreat of the Indians

drifted far down over the deepest current, and the fly straightened out and curved across the stream. There was a break in the water and a slight tug at the line. Jack's impetuous impulse was to jerk, but he remembered just in time. He lifted the tip sharply. The line tightened and the rod bent.

"Give him line," shouted Uncle Tom.

But the fish took line without permission, pulling it swiftly from the reel. The moment the slack came. Jack raised his rod and began to draw the line in with his left hand as he had seen Uncle Tom do. The fish followed, stopped, turned, and made again downstream. Then Jack, who was breathing hard with excitement, suddenly calmed. He was not going to lose his head. He determined to land that trout. He stood erect in the boat, and braced his feet firmly.

"I don't want anybody to say a word to me," he said. "I'm going to land this fish myself or lose him."

It was a good many minutes before Jack landed his trout. Time and again the fish came to the boat side only to dart away. Once it took so long a run downstream that Jack thought it was gone.

Finally, however, the tired trout gave it up, and Jack drew it gently alongside the boat for the last time. Uncle Billy lifted it in.

"Gee, it's a shad!" Jack shouted as he saw its broad, beautiful proportions. His triumph and pent-up excitement found sudden vent. He dropped on his knees with a shout, gathered up the flopping fish, and hugged it.

"Look out! You'll lose him yet," said the boatman sharply. "Trout are full o' tricks."

"That's the finest trout I've ever seen," said Uncle Tom. "How beautiful a big rainbow is, anyway! How deep and full-bodied!"

"Three pounds and a half, I should say," said the boatman admiringly.

The trout measured twenty-one inches.

That is how Jack became an angler.

They returned the next day by way of Cloud's Rest, the highest point abutting the valley, into which they looked down from an elevation of more than a mile. Here they were nearly a thousand feet higher than Half Dome, and were able to see the top of the hooded monster.

The famous Yosemite Valley is only seven miles long, and an average of one mile wide. Several of its lofty, perpendicular walls, if toppled over, would nearly reach the other side.

"What makes it so awfully different from all the

other places we've seen?" asked Margaret. "It isn't a bit like other valleys."

"Its geological history is very interesting," said Uncle Tom. "I talked the other night at the hotel with Doctor Blank of the United States Geological Survey, who is up here testing a new scientific theory. Once all this was solid granite. There was no deep valley, only a gentle depression, probably, down which rushed a stream of water from back in the High Sierra. There were thousands of other streams in these mountains very much like it, and they all cut their own valleys. But right here the granite must have been fractured in such a way as to give the water a greater chance with it than elsewhere, for this valley was eroded much deeper and faster than any other. It may have had a steeper grade, which would have given the river greater cutting power."

"What do you mean by faster?" asked Aunt Jane. "Water surely cannot wear down granite very fast."

"You are right," said Uncle Tom. "When a geologist speaks of a river eroding a granite valley fast, he does not mean what we mean when we say fast."

"He means thousands of years, I suppose," said Mrs. Jefferson.

Photograph by Pillsbury

The Yosemite Valley

"No, he means millions of years," said Uncle Tom. "We cannot appreciate what millions of years mean. No one ever shall be able to realize it. Doctor Blank says that modern science tends to think of geological ages as much longer than formerly was supposed. It may have taken several hundred million years for the river to wear down this valley."

"What made the waterfalls?" asked Margaret.

"These lesser streams, of course, originally ran into the Merced at more or less the same level. But, as the main valley was cut deeper and deeper, these streams were left hanging higher and higher up in the air, till at last the Yosemite Falls over there had to drop half a mile to reach the bottom."

"Yes," said Jack, "but Doctor McKinley told us at Mount Rainier that a valley cut out by a river had sides like the letter V, and this valley has a wide, flat floor. So your nice theory doesn't prove."

"Yes, it does," said Uncle Tom, "for my story isn't finished yet. After the river had worn the valley as deep as it is now, or even deeper (and then it may have been shaped like the letter V), an immense glacier crept slowly through it, and, for maybe hundreds of thousands of years, scooped out its corners and shaped it the way it is now. It was this glacier that polished

Photograph by Pillsbury

Yosemite Fall

those granite slopes that we saw the other day up near Merced Lake."

"But it didn't scoop out old El Capitan," said Jack.

"No, El Capitan proved more than a match for it," said Uncle Tom. "But it did slice off one side of Half Dome. Half Dome was a whole dome originally, you know. The glacier must have undercut its base, so that one side split off and fell upon the ice, and was carried far down the valley."

"Gee!" said Jack, "that was some big job."

"But, Uncle Tom," said Margaret, "I should have thought that the glacier would have scooped out all that nice black soil on the floor of the valley."

"That soil came there long after glacial times, Margaret," replied Uncle Tom. "After the ice receded, there followed thousands of years more of water erosion. At first the Merced River may have filled the valley from side to side, gradually becoming smaller in volume as the glaciers and snow-fields in which it originated in the High Sierra became smaller. It was the Merced River which deposited the rich soil which you now find on the valley's floor."

But the Yosemite Valley, with its seven or eight square miles of area, is a very small part indeed of the eleven hundred square miles contained within the

borders of the Yosemite National Park. In this magnificent area of forests and mountains there are hundreds of beautiful lakes and thousands of streams which very few tourists ever visit. The Jeffersons could not afford the time to explore the greater park, but they determined to make one trip above the valley's rim, "to sample it," as Jack phrased it.

"I want to see the Tuolumne water-wheels," said Uncle Tom. "I have heard it predicted that fifty years from now the Canyon of the Tuolumne will be acknowledged to possess the most celebrated water-spectacle in the world. Now that camps and an automobile road exist above the valley's rim, it is possible for every one to visit the Tuolumne. It is a hard trip, but not too hard, they tell me, for all of us to see the canyon and the water-wheels."

So they broke camp early one morning and travelled on horseback up the long, rocky Tenaya Canyon. At Tenaya Lake they rested and spent the night in a public camp. The next day they fished the Tuolumne River, and spent that night in another camp at Tuolumne Meadows. The third day they visited the canyon.

Of all the noble sights in the Yosemite National Park, Margaret and Jack afterward declared that their

Tenaya Lake, above the valley's rim. One of hundreds in the Yosemite National Park

close-by view of the water-wheels was the most exciting. The canyon tilts sharply till it drops to the level of the Hetch Hetchy Valley, and down these slopes the Tuolumne River finds no resting-place. For several miles it is a continuous succession of cascades, waterfalls, and swift rushes over long granite slopes at sharp angles. Some day a greater poem will be written about Tuolumne water than that by which Robert Southey made the falls at Ladore celebrated throughout the world; for the Tuolumne water is many times as stirring a spectacle as the water that "comes down at Ladore"; in fact, it is itself one of nature's most wonderful poems.

Again and again in these sharp slopes between waterfalls the water strikes cross ledges of rock and rises high in the air, describing long, sweeping arcs before it again joins the rushing river below. Some of these half-circles of white frothing water rise fifty feet before they begin to curve downward. To sit on the sloping granite banks alongside of a giant water-wheel, with falls above and falls below, and this great frothing wheel turning swiftly in front, is to enjoy a sensation which will not dim in remembrance.

It was a day of few words for the Jeffersons. Not even the children were moved to break the silence.

"Isn't it queer," said Jack, "how you don't want to shout here? I just feel like looking awhile and then going back into the woods and get over it."

"It is a fitting climax for this wonderful Yosemite," said Aunt Jane.

It is a paradise of squirrels

IX

A LONG LIFE AND A HAPPY ONE

SOME OF THE TREES IN THE SEQUOIA NATIONAL PARK WERE GROWING THERE WHEN PHARAOH MADE CAPTIVE THE CHILDREN OF ISRAEL

NOW there arose up a new king over Egypt which knew not Joseph. And he said unto his people, Behold, the people of the children of Israel are more and mightier than we: Come on, let us deal wisely with them; lest they multiply and it come to pass that, when there falleth out any war, they join also with our enemies and fight against us, and so get them up out of the land.

Therefore they did set over them taskmasters to afflict them with their burdens. . . . And they made their lives bitter with hard bondage, in mortar and in brick, and all manner of service in the field; all their service, wherein they made them serve, was with rigor.

While Pharaoh was afflicting the children of Israel, as related in the first chapter of Exodus, upon the opposite side of the world a seed so small that one must have looked closely to recognize it as a seed, sank into the warm soil of a gentle valley beneath the

saw-toothed snowy mountains of what is now called California, and, in due time, thrust forth a slender green stalk. This stalk grew rapidly, for the soil was rich, the air soft, and the sheltering forest warm and shady. The first summer it grew a foot or more, straight as an arrow, and put forth small branches and several plumes of feathery, pine-like leaves that seemed unduly large for so small a stalk. In winter it was buried under many feet of snow, and protected from the frost and ice.

The second summer it sprang strongly upward, so that its sharp-pointed top brushed the belly of the deer bounding over it to escape the wolves.

Its tenth summer discovered it a vigorous young tree with sturdy branches. Its foliage now was thick and brilliantly green, each large hanging plume heavy with carved waving filaments. It was a thing of beauty. A cousin to the firs and pines, its neighbors, it far surpassed those of its own age in charm of outline and in softness of foliage and color. It surpassed the pines in height, also; it looked over their heads to its own brothers here and there discernible among the red and gray stems of the old forest.

Many snows fell and melted, many summers came and went, and the strong and ambitious young sequoia

forged its pointed shaft aloft. While it was still an infant it overtopped the lodge-poles. Still a sturdy child, it overmatched the adult oaks. Its trunk was spindling but erect, the figure of aspiring youth.

A thousand years after Pharaoh had led the Jews captive into Egypt, Nebuchadnezzar, King of Babylon, besieged Jehoiachin, the young King of Judah, in his splendid city of Jerusalem.

And he carried out thence (II Kings 24 : 13) all the treasures of the house of the Lord, and the treasures of the King's house, and cut to pieces all the vessels of gold which Solomon, King of Israel, had made in the temple of the Lord, as the Lord had said. And he carried away all Jerusalem and all the princes and all the mighty men of valor, over ten thousand captives, and all the craftsmen and smiths. . . . And he carried away Jehoiachin to Babylon, and the King's mother and the King's wives and his officers, and the mighty of the land; those carried he in captivity from Jerusalem to Babylon.

While Nebuchadnezzar in his turn was wrecking vengeance upon the unhappy children of Israel, the sequoia of the warm valley beneath the saw-toothed snowy mountains was developing its splendid youth. It had

outlived many generations of lesser trees. Forests of sugar-pine, Douglas fir, yellow pine, maple, birch, and oak had arisen, attained maturity, and passed back into the earth that bore them. They had been succeeded by new forests, ever renewing themselves, ever struggling into view of the cloudless summer sky, ever crumbling into decay.

And still the sequoia, glorious in its own bounding life, forged upward. Its lowest branches were even with the tops of many trees now decades past maturity. But the sequoia was still young. Youth was written in its noble aspect, in its proud

Sequoia-tree about 1,500 years old. Observe its rounded top and closely folded mantle of foliage

carriage, in the rigid power of its bent limbs, in the vividness of its tawny green. But now the plumes that had numbered thousands in the days of Pharaoh, numbered hundreds of thousands. And the pointed top which then bored so swiftly upward had grown broad and rounded. It was a crown, for the Prince had become a King.

Now the sequoia towered even with the tallest and noblest of its majestic cousins, the sugar-pines. But it had outlived many generations of sugar-pines. Those which now rivalled it were of younger, swifter growth; but even they had reached the height of tide; soon they, too, would drop under the winter gales.

Six centuries passed and Christ was born in Bethlehem. Israel had found her unconquerable King, and mankind had found its Saviour.

And on that first Christmas Day the sequoia of the valley beneath the saw-toothed snowy mountains, King of Trees, lifted its calm head far above the forest's highest top. It was the first to greet the rising sun that Christmas morning, the last to watch its setting glory. Nobly it lifted its thickening red trunk above the snows, and spread its glistening evergreen to the crisp air.

The sequoia now had attained its greatest height. It towered above all others. Its stem had broadened at the base, and rose thick and straight, tapering slightly to its crown. A hundred feet above the ground its diameter was greater than the base of the giant pines around it. Two hundred feet up its diameter was greater than the base of any except the very largest pines. It rose like a cathedral column.

Many feet above the ground, it thrust out at right angles its lowest branches, thicker than the trunks of most forest-trees, the elbows sharply bent. For the sequoia did not spread its robes; it wrapped its foliage about it, as a Roman wrapped his toga. Its leafy outline was erect and slender, as perpendicular as its mighty trunk; a broad column supporting, under the sky, its dome of living green. The King of Trees, indeed!

Other centuries passed. The Roman Empire rose to its fall. Barbarous hordes warred over the division of Europe. Swaying boundaries settled. Civilization followed Christianity. Art followed civilization. Literature followed art. Commerce discovered the world. Freedom was born. The Americas were developed. Science transformed living.

And during the nineteen hundred years from Christ's birth until to-day, years of turmoil and infinite striving, the sequoia in the valley beneath the Sierra Nevada Mountains has grown into its splendid maturity. Look at it to-day before you. Note its magnificent bulk. Note its aged, knotted limbs, its thinning crown of foliage, its masterful air of the fulness of life. Look well at it, standing there in fullest majesty, thick-limbed, powerful, keenly alive to the uttermost tip of its farthest plume, sternly beautiful, manifestly King, the biggest and oldest and the most lordly living thing.

"Doctor McKinley," demanded Margaret, "do you mean to say you are talking about this very tree here right in front of us?"

"I do," said Doctor McKinley, "I have been telling you the history of the General Sherman Tree—right here in front of us."

"Goodness!" said Margaret, "I thought it was just a story. And so you mean to say— Oh! I wish I had known! It would have been so much more real."

"Yes, I do mean to say that this tree that you have just been dancing around probably began growing when Pharaoh took the children of Israel into cap-

Photograph by Lindley Eddy

General Sherman Tree, from south side

tivity, and has been growing right here during all the history of the world since. Do you wonder that it has become thirty-six and a half feet in diameter? There have been bigger sequoias even than this. John Muir actually counted the rings of a fallen giant that must have begun to grow while the Tower of Babel was building—that is, in the eleventh chapter of Genesis. That tree had more than four thousand rings. Of course the age of the General Sherman Tree can only be estimated, as it is still standing. One must count the rings to make sure. But it is about thirty-six hundred years old. There is a fallen tree a few miles back in the forest that may have been as large as this. We'll visit it to-morrow, and walk through its trunk."

"There must be a lot of timber in this tree," said practical Jack.

"Sawed into inch boards, this tree would make a box large enough to hold the greatest steamship ever built. Yes, and put a lid on the box. It will help you to realize the thickness of this trunk to know that a hole could be made in it large enough to drive a wagon and two street-cars through it, side by side, and still leave the sides sufficiently strong to support the tree."

"Oh," said Margaret, gazing up at it, "if I could

only make the girls at home understand how truly, awfully big it is."

"Let me give you a recipe," said Doctor McKinley. "When you go home take the girls to a church, or

Photograph by Lindley Eddy

Bear cubs are numerous and friendly

other large building, with an empty space or park adjoining. Get Jack to measure out against the front of the church a distance equal to the diameter of the General Sherman Tree, thirty-six feet, six inches,

and drive in stakes big enough to see plainly at a distance.

"Then measure back on the ground in front of the church a distance equal to the height of the tree, two hundred and eighty feet, and stand there facing the church. Then look hard at the stakes and imagine the trunk of the tree filling the space between them. Then raise your eyes slowly and imagine this broad trunk rising up against the sides of the church and above it. When you are looking upward at an angle of forty-five degrees you will be looking at the spot in the sky where the top of the tree would be if it were growing in front of the church."

"Gee!" said Jack. "What fun! But how will you know when you are looking up at an angle of forty-five degrees?"

"That is quite easy," said Doctor McKinley. "Get a large piece of stiff cardboard, and cut it exactly square. Then draw a line from its opposite corners and cut the card along this line. That will give you two right-angled triangles. Hold one of these in front of your face so that the shorter base will exactly parallel the ground; tack it to a tree or pole so that you may be sure about it. Then with your eye at the lower corner, glance up the slanting side, and you will have

your angle of forty-five degrees. Where the point in the sky which you then see intersects the imaginary line of the trunk rising above the church, you will have

Photograph by Edward S. Curtis

A wonderful place to camp out

the height of the General Sherman Tree if it grew in front of your church."

"Oh, how splendid!" said Margaret, jumping up and down in great excitement. "We'll do it the minute we get home."

"But do you understand just how to do it?" asked Doctor McKinley.

"No," said Margaret, "but what do I care? Jack does. Don't you, Jack?"

Jack went over the plan carefully with Doctor McKinley, and made notes and diagrams. Then he nodded confidently to Margaret.

"All right, kid," he said, "I've got it. We'll get the girls and do it the minute we get home. I know just the place."

This was their first afternoon in the Sequoia National Park. They had come in by automobile stage from the railroad-station in the valley, and had settled at the camp in the Giant Forest. They had found Doctor McKinley awaiting them. Their first move, naturally, had been to visit the General Sherman Tree; they spent the afternoon there.

"Why are all those sticks hanging to the bark?" asked Margaret.

Uncle Billy investigated. He threw bits of wood at them, and finally succeeded in dislodging one, which he examined carefully.

"It has been pointed with a knife," he said, "and has somebody's name written on the side of it."

Doctor McKinley laughed.

Sunrise in the Giant Forest

"Those people who have the craze for carving or writing their names everywhere," he said, "are stopped here by the rules. Government imposes fines upon those who deface the big trees. So that is the way they get around the rules. It is harmless enough. It does not hurt the spongy bark to shoot a sharpened stick into it. The bark is a foot and a half thick."

"I'm going to do it, too," cried Margaret.

But Jack was already sharpening a stick, and after many tries he succeeded in so throwing it that the pointed end penetrated and held the bark ten feet or more above their heads.

"It is only polite," Margaret said, "to leave our cards when calling. General Sherman won't forget us, now."

The next morning's walk through the tangled Giant Forest was an experience full of pleasure. The extreme luxuriance of growth astonished them. Gigantic sugar-pines here reached their limit of two hundred feet, and the Douglas fir vied with them. Yellow pines, their bark figured like alligator travelling-bags, Margaret said, abounded; monsters sometimes even equalling the firs. The variety of cone-bearing trees was surprising. There were cedars of magnificent proportions. All the pines and firs were festooned with

Photograph by Lindley Eddy

Sugar-pines in the Giant Forest

bright green moss, which hung in long plumes from their trunks and boughs. The sequoias alone carried no moss.

But in this forest of conifers were found also deciduous trees in large numbers. Live-oak abounded, and oaks of many other kinds. Maples, sweet-scented bay, birches of large girth with curling coppery paper bark, grew in thickets; while passage was often difficult through the luxuriant tangle of bushes of innumerable kinds and varied beauty. And here and there, sometimes alone, generally in groups scattered or closely bunched, rose the gigantic purplish-red columns of the sequoias. It was also a forest of wild flowers and a forest of birds.

The children shouted whenever they broke through a tangle to find before them one of the towering monsters. There were so many of them! They found the Abraham Lincoln Tree, whose diameter is thirty-one feet, and the William McKinley Tree, which, though of smaller girth, towers eleven feet higher than the General Sherman Tree. They greatly admired the perfection of the Theodore Roosevelt Tree, one of the very noblest in form and color in the Giant Forest. They wondered at the many groups whose trees stood close together like cathedral columns.

Group of sequoias in the Giant Forest

"How many sequoias are there?" asked Mrs. Jefferson.

"More than a million, big and little, in the Sequoia National Park," said Doctor McKinley. "Twelve thousand of them are more than ten feet in diameter. There are also a few in the Yosemite and elsewhere."

"I want to sleep out of doors and look up into one of these groves lighted by camp-fires," said Aunt Jane. "I want to wake in the morning with this noble roof overhead."

Aunt Jane's wish was granted before they left the Giant Forest, and it proved an experience that none of them forgot. It seldom rains in the Giant Forest during the summer, and sleeping out of doors was safe and easy.

After lunch they started for the fallen tree, but Doctor McKinley, who had promised to guide them, could not be found. So they secured another guide. Uncle Billy and Aunt Jane were missing, too. As they approached the tree, they overtook Doctor McKinley and Aunt Jane, who had started in advance, and were walking slowly.

"Where's Uncle Billy?" demanded Margaret.

"I think he said he was going fishing," said Aunt Jane innocently.

Margaret whispered to Jack.

"Didn't I tell you?" she asked. "Uncle Billy was as gay as a lark in the Yosemite, and here, as soon as Doctor McKinley arrives, he gets glum and runs off by himself."

"I wouldn't run away if I was Uncle Billy," said Jack valiantly. "I'd fight him."

"Yes, you would," said Margaret scornfully. "The same way you fought the bear in the Yellowstone."

Jack changed the subject.

The fallen monster proved to be a crowning delight. It had been a tree of enormous size, but now was prostrate. The trunk was embedded in the rich soil. Its enormous roots were fully exposed, however, and through them the hollow trunk could be entered by a score or more of men and horses. In fact, a large party was there already with a motion-picture camera. The operator was turning the crank upon a party emerging from the great hole in the roots.

The temptation was too great for Jack. He broke away on the run, dashed into the hole, and marched out at the tail of the last horse, his head held high, his thumbs caught in the armholes of his waistcoat.

Margaret was scandalized.

"There!" she exclaimed. "That's the cheekiest

and most impudent thing I ever saw a boy do. You've spoiled the man's picture."

Jack was well scolded by his mother, too, who fully agreed with Margaret, though she chose her phrases more carefully. Uncle Tom seconded her, and poor Jack was quite crestfallen.

Mrs. Jefferson apologized to the leader of the party, but he made light of it.

"It will be a neat touch," he said. "A bit of involuntary comic is a good thing sometimes. The boy was so immensely proud of himself that it will make the audience laugh. I'm glad he did it."

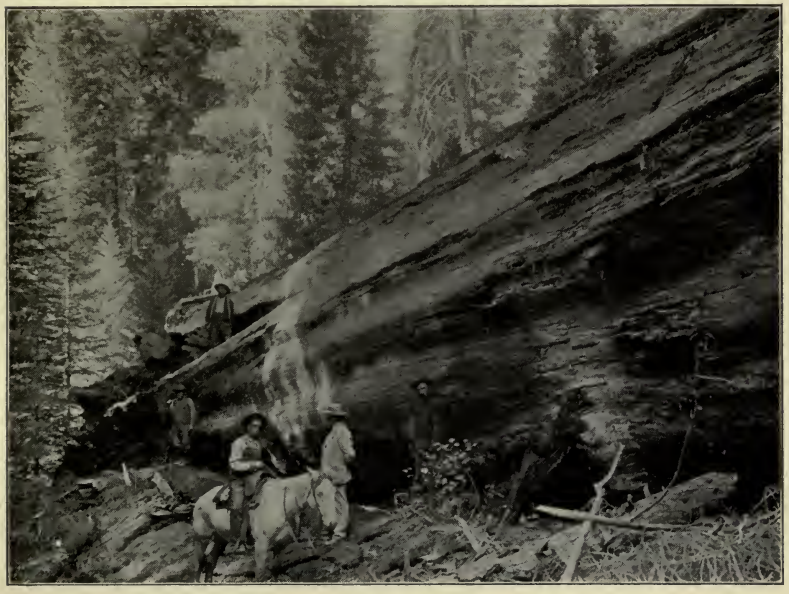
After the motion-picture people had gone Doctor McKinley led his party a hundred feet or more up the fallen trunk, and showed them a large hole through which a man and horse might enter.

"A few years ago," he said, "it was possible to ride your horse into this hole, pass through the trunk mounted, and come out through the hole in the root. The spring rains, however, have washed so much soil inside the trunk that it is impossible to get a horse through now. But it will be easy for us to enter afoot."

The interior was an apartment more than a hundred feet long, and from eight to fifteen feet wide. The floor was flat, beaten soil; the roof a wooden arch.

"It would be the splendidest place to live," said Margaret admiringly.

"And that is no fancy," said Doctor McKinley. "Hollow trunks like these were shelters for Indians



A fallen monster

long before white men discovered the sequoias, and they frequently have served as wilderness homes for hunters and explorers and prospectors. John Muir often lived in them during the years he wandered alone through the Sierra Nevada Mountains studying the

sequoia-trees; I have no doubt he has slept many peaceful nights in this very tree. By the way, Margaret, do you know why the Spaniards named the great mountains back of us the Sierra Nevada?"

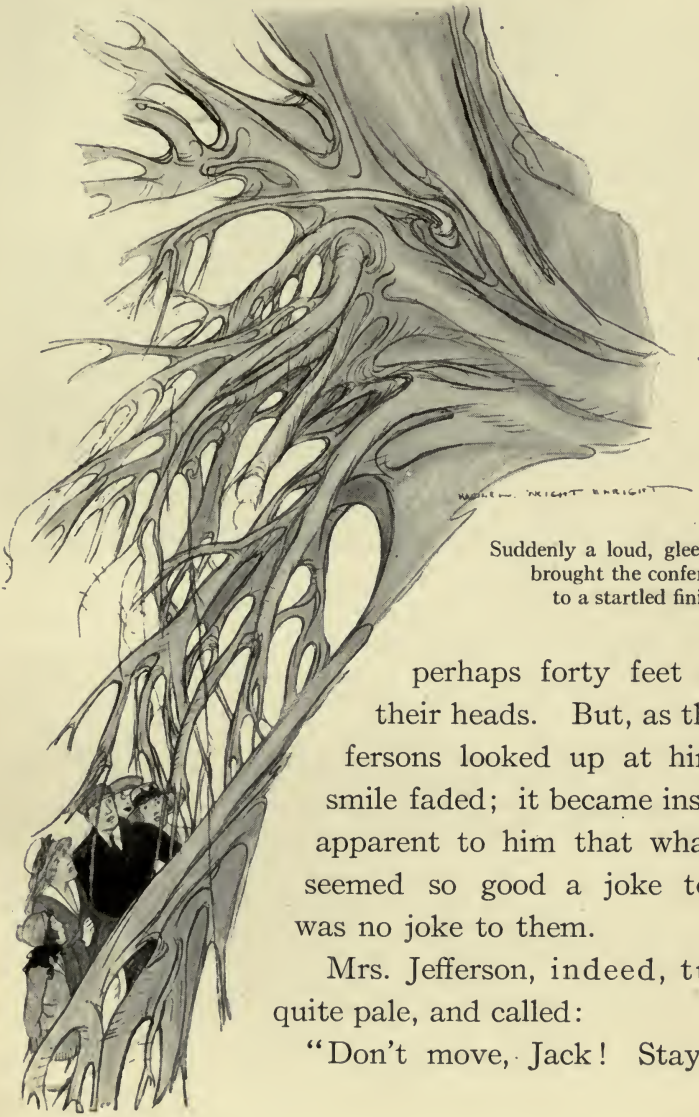
Margaret shook her head.

"Sierra Nevada means the saw-toothed, snowy mountains because——"

"Oh!" she interrupted, "I see now. That's why you called them that in the story."

Jack was missing. They called him but without reply. They hurried out and shouted his name. Mrs. Jefferson, thinking of the tangled wilderness they had come through, was seriously alarmed. Aunt Jane was distracted; Uncle Tom was more vexed than worried; Margaret was scared and tearful. When it was evident that he was out of hearing of their shouts, they gathered by the great root to determine what to do. Doctor McKinley tried to be comforting; he said the park rangers surely would find him before nightfall, but Mrs. Jefferson was not comforted. At best, the nights were very cold in the big woods. They talked earnestly. Margaret began to sob aloud.

Suddenly a loud, gleeful shout brought the conference to a startled finish. There sat Jack, grinning happily, upon the highest up-standing root of the tree,



Suddenly a loud, gleeful shout brought the conference to a startled finish

perhaps forty feet above their heads. But, as the Jeffersons looked up at him, his smile faded; it became instantly apparent to him that what had seemed so good a joke to him was no joke to them.

Mrs. Jefferson, indeed, turned quite pale, and called:

"Don't move, Jack! Stay right

where you are and hold tight. Uncle Tom and Doctor McKinley will come up and get you. Oh, I wish we had a rope. Look out or you'll fall."

"I won't fall," cried Jack; "I'll climb down myself. I won't have any one come for me."

Uncle Tom already was rapidly climbing the tangled roots. Disregarding the protests from below, Jack hurriedly began to scramble down. It would be disgraceful to be helped. But his haste was his undoing. Full a dozen feet from the ground, he slipped and fell face downward.

Doctor McKinley, waiting below, caught him cleverly and lowered him safely to the ground. It is better right here to drop the curtain on the scene.

Later on Jack said to Margaret:

"Doctor McKinley is the only one that didn't jaw me. He's all right. I hope he gets her."

"Well, I don't," replied Margaret. "I'm for Uncle Billy, every time."

X

THE GREATEST DITCH IN THE WORLD

THE GRAND CANYON OF THE COLORADO, IN ARIZONA, IS ONE OF THE WORLD'S MOST WONDERFUL SPECTACLES

TRUE to his promise, Mr. Jefferson, who had business in Los Angeles, met the party there on its way to the Grand Canyon. It was a noisy reunion. For once Jack was excelled in his particular specialty. Margaret clung to her father so persistently that the rest of the family had to beg for a chance; and that night when, after repeated reminders from her mother, Margaret reluctantly went to bed, Mr. Jefferson assured her that he was now fully prepared to score a hundred on any examination paper upon national parks that she could prepare for him.

The next afternoon, as their automobiles were returning from a long neighborhood drive, Margaret rapturously exclaimed:

"And to-night we start for the Grand Canyon!"

"Why wait till to-night?" asked Doctor McKinley, who still accompanied them, "when we have it right here?"

"Where?" cried astonished Margaret.

They were skirting the edge of an arroyo which in early spring carried a roaring torrent of flood water from the mountains to the ocean, but which now was nearly dry. Its banks were many feet deep, and its broad bed was covered with rocks.

"You are not going to tell me that this is the Grand Canyon," said Margaret disdainfully.

"No," said Doctor McKinley, "but let us stop the car at the next bend and see what we shall see."

They stopped the car and walked across the plain to a broad, deep ditch, through whose channel trickled a small stream.

"There!" said Doctor McKinley.

"Oh!" Margaret exclaimed. "Of course I knew all the time the Grand Canyon could not be here. You're joking us, Doctor McKinley."

"Some joke," muttered Jack. "We've walked a precious long way to see just a big old ditch. I've seen a million like that back home."

"Yes, you've seen several," Doctor McKinley replied. "But this is the Grand Canyon just the same; and so are your ditches at home—in miniature."

"Oh, I see what you mean," said Jack. But Margaret was still mystified.

"Now let us see what has happened here to account for so tiny a stream having so big a ditch," said Doctor McKinley. "You will notice that this broad, flat, sandy plain seems level, but that, nevertheless, it slopes ever so gently westward from those foot-hills several miles back near the mountains. Those hills and this plain become saturated with the early spring rains, and this is the stream which drains them. To-day, in the dry autumn, it is so small you can scarcely see its current, but in the late winter and spring a great deal of water flows through it. During its turbulent months it has been burrowing deeper and deeper into the soil, until now, after many years, it lies far below its original level.

"Now just above here, you see, still a smaller stream runs in from the side, draining the plain from the north. Many of these small streams enter it from both sides. They are all dry now, but from the depth of their ditches you will see that in the wet months they are fairly good-sized tributaries.

"Now let us look attentively at the big ditch. Here the current swirled around a deposit of stiff clay, leaving a pyramid rising from the bottom. Over here it swirled around those sandstone slabs, several of which stand up like spires. Now on one side, now on

the other, it has left mimic plateaus abutting the deeper central channel. Where this little tributary stream enters, we see a high cliff, probably of stiff conglomerate rock, rising almost to the original level. The tributary was not strong or constant enough to wear it away, and so it worked around it, digging its channel out of the softer earth and sand.

"In this way, during many, many years of succeeding flood times, this stream and its tributaries have succeeded in scooping out an astonishingly big ditch from the bottom of which rise many cliffs and spires and plateaus which the current was not strong enough to wash away."

"Gee," said Jack. "That is interesting. It is the first interesting ditch I ever saw."

"No," said Doctor McKinley, "that is not quite true. You mean that it is the first ditch of any kind you ever really looked at. It is interesting only because you understand it. All ditches are interesting when you understand them. And all ditches are alike, even the Grand Canyon."

"Is the Grand Canyon a ditch?" asked Margaret, big-eyed in surprise.

"Yes," said Doctor McKinley, "the Grand Canyon is nothing but a ditch. The State of Arizona is a

Photograph by Putnam Valentine

The Grand Canyon of the Colorado River

great plain—like this. It slopes seaward from great mountains—like this. Its waters drain into a stream —like this. The stream has worn a ditch through the plain—like this. That is why, before you went there, I wanted to show you this miniature Grand Canyon, which I ran across one day a few years ago while on a walking tour."

"But the real Grand Canyon is a lot bigger than this ditch, isn't it?" asked Margaret anxiously.

"Well, rather," laughed Doctor McKinley. "This ditch may be ten feet deep; the Grand Canyon is six thousand feet deep. This ditch may be a hundred feet wide; the Grand Canyon is twenty miles wide. This ditch is carved out of brown, sandy loam; the Grand Canyon is carved out of marvellously colored sandstone rock. The mimic mud and sandy cliffs and domes you see here are gigantic carved and minareted stone towers there.

"But, though so different, really they are precisely the same. Both are identical works of erosion. This tiny stream drains perhaps six or eight square miles. The Colorado River drains three hundred thousand square miles. Now let us get back to dinner."

It was a silent, awestricken party that stood upon the rim of the Grand Canyon the following day. Even

Photograph by Fred Harvey

Sunrise over the canyon. Shadows still fill the deep gorge which contains the river

Jack had nothing to say, and, when Doctor McKinley began to explain its wonders, Aunt Jane stopped him with a gesture.

"Later on," she whispered. "This is the time to just feel."

She and Mrs. Jefferson sank upon a rock and said nothing for nearly an hour. The others grouped near them. Margaret and Jack walked some distance away with Uncle Tom, but they quickly returned.

"It's lonesome out there," said Margaret shivering. She nestled close to her mother.

The morning sun cast the shadows of the near rim darkly upon the depths, while it bathed with glowing light the red and green strata of the opposite side. From far below arose a gigantic city of monster painted cathedrals. An eagle soared slowly below them. The men pointed to different features in the marvellous spectacle and nodded silently to each other.

"Its like church, isn't it, Mother?" Margaret whispered softly.

The sun rose higher; the sunshine in the depths gradually devoured the shadows. After a while Jack said:

"Somehow I—I feel kind o'—good."

All laughed. Aunt Jane clapped her hands. The two uncles moved about and lighted cigarettes.

"We had better come out here to live," said Mr. Jefferson.

Mrs. Jefferson laughed with a little catch in her voice. The men began to talk in loud tones. A strain of emotion, which all had felt but not realized, seemed to lift.

They spent all that day upon the canyon's rim. They watched the trail travellers below through the telescope. They chatted with the Indians. They examined the Powell Monument. They walked miles and gazed into the amazing gulf from many points of view. All day Mrs. Jefferson was strangely silent; and brilliant rosy spots glowed in Aunt Jane's cheeks. Neither wanted to leave the rim even long enough for luncheon.

Late in the afternoon Doctor McKinley drew Aunt Jane to one side and talked earnestly.

"Do you see that?" asked Margaret.

"See what?" Jack rejoined.

"Aunt Jane doesn't want to go with him."

"Well, what does she go for, then?" asked Jack, watching them. "Like fun she doesn't want to go! Look at her smile at him. How funny she looks back at Mother!"

"She's awfully nervous," observed Margaret. "I

think she wants Mother to go, too. But Mother doesn't even see her. She's just absorbed in that canyon."

"You think you know an awful lot," said Jack sarcastically.

"I do," said Margaret with a wise nod. "At least I know a lot more than you do. You can't even see."

"But I can beat you running," said Jack.

"Come, children, take a walk with us," called Uncle Tom gayly, as he and Uncle Billy swung by.

"No, I don't want them," said Uncle Billy shortly. "I want a real walk."

"Gee, isn't he the savage one!" cried Jack resentfully as the two passed on. "Now what have we ever done to him? Why shouldn't we go if we want to? I can walk as fast as he can. What's the matter with him, anyway?"

"To think of your not even knowing that!" exclaimed Margaret.

"Say," said Jack critically, "I never saw a girl so stuck on herself as you are."

The next morning they breakfasted early in preparation for an overnight trip into the canyon. The guide was waiting. Mr. Jefferson had picked out the mules the night before.

Photograph by Herford Cowling

Indians above the rim

"Are we going all the way down?" asked Margaret over her oatmeal. "All the way to that teenty bit of a river that we saw yesterday from the Point with the funny Indian name?"

"Straight to the river," said Mr. Jefferson. "But it isn't such a tiny river as it looks from up here. In

fact it is one of the great rivers of America. From the source of its largest confluent, the Green River, to its mouth in the Gulf of California, it is two thousand miles long."

Doctor McKinley came down late, the only one not in riding clothes.

"Have you forgotten," asked Mrs. Jefferson in surprise, "that we are going to the river this morning?"

"I am suddenly called East," he explained. "It is a disappointment, of course; I had expected to see this delightful party to its finish. But now it is impossible."

Doctor McKinley's tone was one which forbade questions. But they all recalled that at lunch the day before he spoke of remaining with the party, even of accompanying them as far as Chicago on the way East.

Nothing more was said. Doctor McKinley ate a hasty breakfast and saw them mount their mules. Then he said good-by. Uncle Billy, under Margaret's watchful eye, looked keenly into Doctor McKinley's face as he shook hands with a cordiality he had never shown before. Then, with a loud whoop, he spurred his mule to the head of the line, shouting gayly:

"Forward! March! We are going to have a wonderful, wonderful day!"

Margaret drew alongside of Jack.

"I know," she said in a low tone, "why Doctor McKinley left so suddenly, and it wasn't business at all."

"What was it, then?" Jack demanded.

"Something happened on that walk he took with Aunt Jane before dinner, yesterday. He asked her to marry him, and she wouldn't. That's the reason he went away so suddenly this morning."

"How do you know?" Jack demanded. "Did Aunt Jane tell you?"

"No, goose. That's the last thing in the world Aunt Jane would ever tell."

"How do you know, then?"

"Because I watched Aunt Jane this morning, and she wasn't even surprised when Doctor McKinley told us he was going away; but she blushed a lot."

"Well, you're too much for me, the way you guess things," said Jack thoughtfully. Presently he added: "Well, I don't care. He tells good stories, and I'd like to have had him for an uncle. But he wouldn't do, anyway. Why, he's an old man. I heard Mother say he must be every day of thirty."

It proved a wonderful day, indeed. The safe trail descended the precipitous wall in short zigzags, and

wound its long, sinuous way across broad plateaus and around the bases of enormous cathedral-like rocks.

"It is like dropping into a paint-pot," said Mrs. Jefferson. "I am fairly intoxicated with color."

"And these astonishingly fantastic shapes!" said Aunt Jane, smiling happily. "Seen from above they were amazing, but, looked up at from below, they are unreal. I'm dreaming them, not seeing them."

"We are living in the Arabian Nights," said Margaret. "These aren't rocks at all, they're giants' palaces."

"Sure thing," said Uncle Billy sportively. "Pretty soon a giaour will pop out of one of them and gather us all up for dinner. We'll make a fine juicy stew for him."

"Don't you feel the relief of a broken sky-line?" asked Mr. Jefferson. "Yesterday, looking into the canyon from above, we never could get away from that deadly level horizon. The picture everywhere was framed in straight rims. But to-day, looking up from below, we lose sight of the rim and see the sky-line broken by the spires and minarets of these Aladdin palaces."

"It is some relief," Mrs. Jefferson admitted. "But

Photograph by Fred Harvey

The trail into the canyon

I shall not let you belittle the view from the rim. That, after all, is the great view. But one must see this, too. Each is perfect of its kind, and both are necessary to any real comprehension and appreciation."

It was Uncle Billy's great day, sure enough. He devoted himself to the children, joked constantly with Margaret and ran mule-races with Jack over some of the level stretches. He found the best echoes for them and shouted louder than Jack.

"He's trying to make up for being mean to us yesterday about that walk," Jack whispered to Margaret.

"It's no such thing," Margaret retorted. "He didn't even know he was mean to us. No, that isn't why he's so jolly. It's something altogether different."

Jack looked at Margaret sharply, but said nothing. He wanted to know what she meant, but would not confess his ignorance. He was beginning to feel a little more respect for girls.

Having their own separate party and, as Mr. Jefferson put it, "all the time there is in the world," they frequently dismounted to rest and enjoy the varying views.

"This everlasting going down is just a little trying," said Mrs. Jefferson. "If only we could climb up a bit now and then for a change it would help."

Photograph by George R. King

On the brink of the river's gorge

"But it is perfectly safe," said Uncle Tom.

"Oh, absolutely," said Mrs. Jefferson. "The trails are so broad. I only want a little change."

"There was an old Scotchman went down with me last year who had never been on horseback," said the guide. "He was eighty-two years old and a good sport. He didn't mind the steep trails, but he was terribly nervous about the mule.

"'How must I sit?' he asked me anxiously.

"'Right straight up,' I said. 'Just rest easy and leave it all to the mule. No, don't bend over. Hold your body at right angles to the mule. That way.'

"Well, that was up on the rim before we started down, and the ground, of course, was level. But he obeyed me literally about sitting at right angles to the mule, and, the first sharp grade we struck, of course he fell clear over the mule's head onto the trail."

"Goodness!" cried Mrs. Jefferson, "and was he awfully hurt?"

"He never admitted it," said the guide. "But he was Scotch, you know, and wouldn't. The old chap rolled off the trail and sprawled face down the edge of a rock about two hundred feet steep. I shouted to him: 'Lie still and I'll get you. Shut your eyes so

you won't get dizzy.' But he was on his feet in a minute.

"'Oh, I've climbed hills all my life,' he said. 'It ain't them that bothers me; it's the durn mule.'"

They ate lunch by the trail side, near a stream. The final descent to the river's edge was inspiring. Every turn of the corkscrew trail disclosed new beauties and, when at last they dismounted beside the broad, swelling, surging river, the children shouted with excitement.

They were in the bottom of a gorge whose cliffs rose steeply several thousand feet on either side. Above these cliffs, and of course invisible to them, stretched the broad levels of the greater canyon floor, across which they had passed; but they could see some of the huge painted rock formations built upon it, and, here and there, beyond and above these, the dimmer outlines of the distant rim.

"Gee," said Jack, "this sure is some place. But, Uncle Tom, what makes the water so muddy? It looks like thin brown paint."

"The river, Jack, is still engaged in the work of cutting the Grand Canyon deeper and broader, and——"

"But, Uncle Tom," Jack interrupted, "how can

soft water cut into hard rock? I never really did understand that."

"The same way that the soft hands of workmen cut into hard rock," said Uncle Tom, smiling. "With tools, of course."

"Tools?" cried Margaret. "What tools has the river?"

"Rocks and sand," said Uncle Tom. "Sand is the river's principal cutting tool. The hard, angular little grains of sand are swept rapidly down-stream by the fast current, each grain scratching the rock on the bottom as they all roll and tumble along. Billions of billions of sand grains keep scratching the rocks day and night, century after century. The river is like a strip of sandpaper two thousand miles long, perpetually wearing down the bottom. Then, too, the stones and loose rocks help by bumping along with the current, denting the river's bottom and sides, and breaking off pieces here and there. These loose rocks are continually making more sand, too. Don't you remember those pot-holes in the rocks that we saw in Glacier and Yosemite? See, there's a big one here in this rock."

"Oh, yes," Jack exclaimed. "I remember you told me that loose rocks cut those big holes that looked like giants' bathtubs."

Photograph by U. S. Forest Service

At the river's edge. The walls of the gorge rise abruptly from two to four thousand feet

"Now, Jack, I was the one who said they looked like giants' bathtubs," protested Margaret.

"Well, I didn't say you weren't, did I?" Jack snapped.

"This pot-hole," said Uncle Tom, "was made by the current pushing a loose rock around and around inside that hole, making it deeper and wider year after year."

"But however did the river make this dreadful big canyon?" asked Margaret.

"Oh, yes," said Uncle Tom. "Now, listen. A million tiny streams in Colorado and Idaho and Utah and Arizona are grinding down and scooping out their valleys, and carrying each its little burden of muddy sediment into the Grand and Green Rivers, which unite to form the Colorado River. All this sediment the river industriously sweeps down into the sea. Then, right here in the Grand Canyon, are many streams, like Bright Angel Creek, which we saw from the hotel, which continually work their way deeper into the rocks, and also empty their sediment into the river. In the spring, when the snows melt on the river, all these streams swell into torrents, and cut deeper and still deeper into the rocks.

"The frost is busy, too. Every winter it chisels

little pieces off all these great rocks; the spring rains wash them into the little streams; the little streams wash them into the river, and the river washes them into the sea."

"Oh," said Margaret, "then it was really the river that, with the help of these millions of little streams, cut out the whole of the Grand Canyon? But, Uncle Tom, what became of all the stuff that it cut out? Did the river really carry it all into the Gulf of California?"

"Every atom of it," said Uncle Tom. "It took millions and millions of years to do it, of course; but it is still at work. That is why the water is so muddy."

They had climbed out upon a rocky point past which the river surged in swift cascades.

"Nobody ever could keep a boat floating on this river, could he, Uncle Tom?" asked Jack. "No boat ever could run down those rapids."

"Yes," said Uncle Tom, "boats have done it. Haven't you heard how the Grand Canyon was first explored?"

Jack shook his head.

"Do you mean to say that Doctor McKinley missed telling you the story of Major Powell's great adventure?"

"Oh, tell us." Both children spoke at once, and the rest of the party gathered around.

"Well," said Uncle Tom slowly, "that was one of the greatest of American adventures. For many years the Grand Canyon remained unexplored. Even the windings of the river's course were not defined. No Indian had ever entered the canyon. The Indians feared it, believing that it was guarded by spirits.

"The Indian legend is picturesque. There was a chief who mourned the death of his wife. No one could comfort him. One day the god Ta-vworts appeared to him and assured him that his wife was happy in Paradise. The chief replied that, if only he could be certain of her happiness, he would be satisfied. So Ta-vworts made a trail through the mountains which guarded Paradise, and through this he conducted the chief, who, seeing his wife happy, returned and mourned no more. The trail was the Grand Canyon.

"But Ta-vworts, fearing that the chief would show others the trail to Paradise, caused a turbulent river to flow through it, which would destroy those who should try to travel it. He also stationed spirits to guard it. That river is the Colorado.

"The Indians believed this legend, and told the white men that, deep in the great gorge were enor-

Photograph by Herford Cowling

Thunder-storm brooding over the canyon

Bancroft Library

mous waterfalls. They said that the river ran through dark underground passages. No man who entered passed through alive.

"But there was one man who dared. His name was John Wesley Powell, and he was a school-teacher who afterward became a celebrated geologist. He had lost his right arm in the Civil War, but even that could not stop him.

"These great canyons interested him, and he determined to explore them. He got four open boats and filled their compartments with provisions for a long journey. He persuaded nine adventurous men to accompany him, and, early in 1869, started far up on the Green River and floated down. Frequently he stopped to study the rocks, for this was a scientific expedition.

"In late August, when he came to the head of the Grand Canyon, there were very few provisions left; half had been lost in an upset. But they went boldly in, nevertheless. They knew nothing of what would befall them. Perhaps they would rush over waterfalls as high as Niagara; they did not know. Perhaps they would drop into the underground passage which the Indians had described; they did not know that, either. All they knew was that the walls were im-

passably steep, and that the river rushed so swiftly into the great canyon that, once started, they never could return. They must go through to the end or die in the going. They were brave men, and they went on.

"What made the passage all the more dangerous was that their food was nearly exhausted. Most of the flour they had left was wet; even their matches were wet.

"But on they went. Often they embarked in their boats at the head of some long swift rapid whose end was hidden by a curved wall. Was there a waterfall at the end of the rapid? Or were there rocks upon which their boats would be dashed to pieces? They did not know. It was too late to turn back.

"Sometimes these rapids were so swift and rocky that they had to lower their boats, one by one, with ropes. Often they were thrown out by the tossing of the boats, and had to swim. Often the boats were upset; indeed they lost all their scientific instruments, and part of their little remaining food in this way. One of the boats was broken to pieces, but the men in it were saved.

"They never clearly knew where they were, for there were no landmarks. Sometimes a full day's labor only

carried them a mile or two, so dangerous was the going. How long the canyon was they did not know. All they knew was that they were weary and cold and wet, that they could light no fires to warm themselves, and that they were hungry, and almost without food. No wonder that some of them were discouraged. The time came when none, even the intrepid Powell, really had much hope left of living to the end. But Powell's precious notes were safe in his pocket. That was his comfort. His body perhaps would be found, and the scientific notes saved.

"There came a day when food was reduced to a little wet flour. That night four of the men went off by themselves to talk, and then returned and reported to Powell that they were going to desert. They explained that they thought the gorge at that point could be climbed, and that they preferred to take the chances of finding a way up over the rim rather than to go on with the others to certain destruction.

"Powell made no objections. He believed their chances of escape over the rim were very small, and told them so. There were no villages on the deserted plain above the rim where food could be had; and there were hostile Indians. But the deserters, now fairly terror-stricken, were not to be deterred. Powell

offered them half of his handful of wet flour, but they declined it. The next morning they started on their perilous attempt, and Powell and his faithful five climbed into their boats and went on.

Camping in the Grand Canyon

"Hope was now almost abandoned. That day the last of the food was eaten, and the desperate party, with perhaps many days of danger and hardship before them, toiled manfully on. But the very next

morning their boats emerged at the foot of the canyon, where they found food and safety."

"And what became of the four deserters?" asked Jack.

"They were never seen again. In his book, 'The Explorations of the Colorado River of the West,' Powell stated they were killed by Indians. He published the Indians' confessions."

"Is that a true story?" asked Margaret.

"It is history," said Uncle Tom. "Powell afterward became Director of the United States Geological Survey, and a very famous man. We saw yesterday the rock shrine erected by the Department of the Interior to his memory."

The night the Jeffersons spent in camp in the depths of the Grand Canyon was in some respects the most memorable of their summer's experience. Sunset over the rim, the wonderfully deepening shadows, the glow of the camp-fire against the painted rock—these lingered long in memory.

Soon after supper, Uncle Billy and Aunt Jane dropped out of the camp-fire gathering, and disappeared in the gloom. They were gone so long that Mrs. Jefferson became nervous.

"I'm afraid they've lost their way," she said.

The children were still up when they wandered unobtrusively back into camp. Uncle Billy swaggered

"You little witch," she whispered, "I believe you know"

nonchalantly to the fire and warmed his hands. He wore a broad and happy grin. Margaret looked at him attentively. Then she turned to Aunt Jane, who lingered in the background, her face lighted by the

blaze. Margaret approached her slowly, studying her rosy face and soft, happy eyes. Then she crept up, threw her arms around her neck, and whispered:

"Oh, dear Aunt Jane, I am so, so, so awful glad."

Aunt Jane, with a quick surprised movement, loosened the enfolding arms, and looked keenly into the child's face. Margaret nodded mysteriously. Aunt Jane gave a glad little cry and hugged her.

"You little witch," she whispered, "I believe you know."

"I do." Margaret nodded happily.

Aunt Jane kissed her rapturously, and whispered:

"But you must keep my secret."

"Oh, I will," said Margaret.

"Promise me."

"I promise solemn," said Margaret. "See, I cross my heart."

(The End.)